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☐	L7	l5 and L6	60
☐	L6	enrich or enriched or enrichment	97765
☐	L5	l3 and L4	170
☐	L4	milk.ti. or dairy.ti.	9832
☐	L3	l1 and L2	3484
☐	L2	s (milk adj1 protein adj1 concentrate) or (whey adj1 protein adj1 isolate)	4715422
☐	L1	lactalbumin or lactoglobulin or sialyllactose	4301

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10/747731

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10/747731

=> file fsta frosti
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=> lactalbumin or lactoglobulin or sialyllactose
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=> s lactalbumin or lactoglobulin or sialyllactose
L1 4825 LACTALBUMIN OR LACTOGLOBULIN OR SIALYLLACTOSE

=> s (milk and protein and concentrate) or (whey and protein and isolate)
L2 3772 (MILK AND PROTEIN AND CONCENTRATE) OR (WHEY AND PROTEIN AND ISOLATE)

=> s l1 and l2
L3 374 L1 AND L2

=> s (milk adj1 protein adj1 concentrate) or (whey adj1 protein adj1 isolate)
L4 0 (MILK ADJ1 PROTEIN ADJ1 CONCENTRATE) OR (WHEY ADJ1 PROTEIN ADJ1 ISOLATE)

=> s milk protein concentrate
L5 265 MILK PROTEIN CONCENTRATE

=> s whey protein isolate
L6 997 WHEY PROTEIN ISOLATE

=> s l3 and l5
L7 13 L3 AND L5

=> d 1-13 all

L7 ANSWER 1 OF 13 FSTA COPYRIGHT 2004 IFIS on STN
AN 2003:P1822 FSTA
TI Effect of heating the solutions of **milk protein concentrate** on the composition of proteins, Ca and P in a gel network after rennet and acid-rennet coagulation.
AU Zbikowska, A.; Szerszunowicz, I.
CS Katedra Biochem. Zywnosci, Wydzial Nauki o Zywnosci, Uniwersytet Warminsko-Mazurski, 10-957 Olsztyn, Poland. Tel. (48 89) 523 47 75. Fax (48 89) 524 04 08
SO Polish Journal of Food and Nutrition Sciences, (2003), 12/53 (2) 37-41, 23 ref.
ISSN: 1230-0322
DT Journal

LA English
SL Polish
AB Effects of heating solutions of **milk protein** concentrates (MPC) on composition of proteins forming a gel network and proportions of Ca and P therein were evaluated. MPC obtained by spray drying an ultrafiltration retentate were reconstituted in water. Aqueous solutions of 34 g MPC/l and pH 7.1 were heated at (i) 72°C for 15 s or (ii) 92°C for 60 s, cooled in iced water to 20°C, and mixed with sodium azide and streptomycin (0.02% of each). In some solutions, pH was reduced to 6.6 or 6.0 using lactic acid. Chymosin was used to obtain curds at 32°C. Rennet clotting time averaged 70.2 and 80.4 min in (i) and (ii), respectively, at pH 6.6, vs. 62 and 64 min at pH 6. Contents of N, Ca and P were analysed in insoluble curd matrix fractions; proteins were separated by SDS-PAGE and percentage of electrophoretically separated proteins in insoluble and soluble fractions was determined. Heating MPC solutions did not significantly affect proportions of Ca and P in rennet gel, but significantly increased proportion of N in insoluble fractions. Increasing temperature of heating increased proportion of β- **lactoglobulin** in curds, and proportion of unidentified fractions resolved between β-casein and β- **lactoglobulin**. Increasing heating temperature also limited the percentage of casein. Heating at (ii), but not (i), significantly reduced levels of Ca and P in insoluble fractions of curds. Heating significantly increased Ca:P ratio in insoluble fractions of curds obtained after proteolysis. Regardless of heating, relative percentage of whey proteins, mainly β- **lactoglobulin**, was higher in acid-rennet curds than in rennet curds. Contents of β- **lactoglobulin**, α- **lactalbumin** and bovine serum albumin + immunoglobulin in soluble fractions of curds obtained from (ii) were reduced by 13.7, 1.6 and 3.9%, respectively, compared with unheated substrates.
CC P (Milk and Dairy Products)
CT CALCIUM; COAGULATION; CURD; HEATING; NITROGEN; PH; PHOSPHORUS; **PROTEIN CONCENTRATES**; **PROTEINS MILK**; TEMPERATURE; CA; **MILK PROTEIN CONCENTRATES**; **MILK PROTEINS**; N; P; TEMP.

L7 ANSWER 2 OF 13 FSTA COPYRIGHT 2004 IFIS on STN
AN 2003:P1360 FSTA
TI Effect of heating **milk protein concentrate** on enzymatic coagulation phase.
AU Zbikowska, A.; Szerszunowicz, I.
CS Inst. Biotech. Zywnosci, Wydzial Nauki o Zywnosci, Uniwersytet Warminsko-Mazurski, 10-957 Olsztyn, Poland. Tel. (48 89) 523 47 75. Fax (48 89) 524 04 08
SO Polish Journal of Food and Nutrition Sciences, (2002), 11/52 (4) 23-27, 39 ref.
ISSN: 1230-0322
DT Journal
LA English
SL Polish
AB Denaturation of **milk** proteins subjected to each of 2 heat treatments was assessed. In addition, proteolysis of the heat treated **milk** proteins by chymosin (EC 3.4.23.4) was studied at various pH values. Aqueous solutions of **milk protein concentrate** (34 g **protein**/dm.sup.3) were heated at 72°C for 15 s or 92°C for 60 s, then cooled to 20°C. Solution pH was adjusted to pH 7.1, 6.6 or 6.0 by addition of lactic acid. Chymosin was added to samples incubated at 32°C at concentration necessary to obtain a rennet clotting time (RCT) of 30 min in non-heated samples. The number of peptides and glycopeptides released during coagulation were determined. Amount of denaturation of β- **lactoglobulin** and α- **lactalbumin** in the heated samples (prior to chymosin treatments) was also measured. Pre-heating of the **milk protein** solution at 72 and 92°C, increased

lactalbumin and β- **lactoglobulin** denaturation and limited the number of peptides released during chymosin treatment at pH 7.1 by 33.3 and 25.0%, respectively, compared with non-heated samples. The effects are attributed to changes in enzyme accessibility of the glycosylated κ-casein. At pH 6.6 and 6.0, pre-heating of **milk** proteins to either temperature reduced peptide release during coagulation by 13 and 11.2%, respectively. At pH 6.6, significant differences in RCT (P = 0.05) were apparent between samples; RCT increased by 17 and 34% relative to a non-heated control in samples heated to 72 and 92°C, respectively. At pH 6.0, however, RCT increased significantly (P = 0.05) only in substrates heated to 92°C. It is concluded that proteolysis and aggregation of **milk** proteins during enzymic coagulation are dependent on changes to the proteins occurring during pre-heating irrespective of the pH at which coagulation is performed.

CC P (Milk and Dairy Products)

CT COAGULATION; DENATURATION; **ENZYMES MILK CLOTTING**; HEATING; PH; **PROTEINS MILK**; PROTEOLYSIS; TEMPERATURE; CHYMOSIN; **MILK PROTEINS**; TEMP.

L7 ANSWER 3 OF 13 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(12):P2028 FSTA

TI Membrane filtered **milk** proteins varying in composition and functional attributes.

IN Blazey, N. D.; Knights, R. J.; Chao Wu

PA New Zealand Dairy Board; New Zealand Dairy Board, Wellington, New Zealand

SO PCT International Patent Application, (2000)

PI WO 2000051440 A1

PRAI WO 1999-NZ26 19990301

DT Patent

LA English

AB A method for producing **milk** proteins which vary in composition and functional properties is described. An approx. neutral fluid **milk** composition, which includes **milk protein concentrate** and **milk** plus added whey, is treated by first increasing its pH by addition of an alkali, followed by heating and cooling, and then lowering its pH by addition of an acid. The liquid is then subjected to ultrafiltration and is preferably diafiltered. Selection of the appropriate alkali, pH values, temperature, acid and membrane porosity results in improved yields of **milk** proteins in the retentate; in addition, these proteins will have improved levels of flavour, solution viscosity and solubility. Ca content of the **milk** proteins obtained from the treated **milk** will also be increased by approx. 50%, compared to retentate from standard **milk**. Appropriate selection of processing conditions may result in a filter permeate with a **protein** composition that is enriched in α- **lactalbumin**.

CC P (Milk and Dairy Products)

CT FUNCTIONAL PROPERTIES; PATENTS; PH; **PROTEINS MILK**; TEMPERATURE; ULTRAFILTRATION; **MILK PROTEINS**; TEMP.

L7 ANSWER 4 OF 13 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(02):P0284 FSTA

TI Rennet clotting times of skim **milk** based rennet gels supplemented with an ultrafiltered **milk protein concentrate**.

AU Sridhar Kameswaran; Smith, D. E.

CS Dep. of Food Sci. & Nutr., Univ. of Minnesota, St. Paul, MN 55108, USA

SO Milchwissenschaft, (1999), 54 (10) 546-550, 18 ref.
ISSN: 0026-3788

DT Journal

LA English

SL German

AB Skim **milk** samples were taken before and after **milk** was subjected to 2 pasteurization conditions (73 and 85°C, 17 s). Less severe pasteurization resulted in only minimal denaturation of the 2 major whey proteins, α- **lactalbumin** and β-**lactoglobulin**. At the high heat condition, denaturation of these proteins was in the range of 12 and 26%, respectively. Milks were then ultrafiltered and spray dried to manufacture **milk protein** concentrates (MPC). Average concentration of **protein** and lactose in the dried products were 82 and 2%, respectively. Rennet coagulation studies, using a formagraph, were conducted on reconstituted non-fat dry **milk** solutions supplemented with MPC at **protein** concentration ranging from 4.65 to 6.25% **protein** by weight Rennet clotting times were not significantly influenced by heat treatment, suggesting that extent of whey **protein** denaturation was not sufficient to alter rennet clotting times. There was a significant effect on retentate pH on rennet clotting time. Samples with added MPC produced from pH 6 retentate had significantly higher levels of ionic calcium.
CC P (Milk and Dairy Products)
CT COAGULATION; DENATURATION; **ENZYMES MILK CLOTTING**; **MILK** ; PASTEURIZATION; **PROTEIN CONCENTRATES**; **PROTEINS MILK**; WHEY; **MILK PROTEIN CONCENTRATES**; RENNETS; **SKIM MILK**; WHEY PROTEINS

L7 ANSWER 5 OF 13 FSTA COPYRIGHT 2004 IFIS on STN
AN 1992(04):P0112 FSTA
TI Trends in the production & utilisation of dairy **protein** products: production.
AU Mulvihill, D. M.
CS Food Chem. Dep., Univ. Coll., Cork, Ireland
SO CSIRO Food Research Quarterly, (1991), 51 (3/4) 145-157, 16 ref. ISSN: 0310-9070
DT Journal
LA English
AB The manufacture of **milk protein** products is described with reference to the following aspects: production of caseins and caseinates; miscellaneous methods of casein and co-precipitate isolation; industrial scale fractionation of caseins; production of **whey protein**-enriched products including **whey** powder, **whey protein concentrate**, **whey protein isolate**, and **lactalbumin**; casein-**whey** co-precipitate production; and **milk protein concentrate** production.
CC P (Milk and Dairy Products)
CT **PROTEINS MILK**; **MILK PROTEINS**

L7 ANSWER 6 OF 13 FSTA COPYRIGHT 2004 IFIS on STN
AN 1981(10):P1779 FSTA
TI [Uses of **milk protein** in the food industry.]
AU Visser, F. M. W.
SO Zuivelzicht, (1981), 73 (8) 156-158, 5 ref.
DT Journal
LA Dutch
AB The production of various types of **milk protein** is discussed, with a flow sheet showing procedures for manufacture of soluble **milk protein concentrate**, coprecipitates, caseinates (from acid casein), rennet casein, soluble whey **protein concentrate**, and insoluble **lactalbumin**. These **milk** proteins can be used in various sectors of the food industry either for nutritional or for technological reasons. They can be used, for example, as emulsifiers (in soups, sauces, spreads, etc.), as foaming agents (in desserts, etc.), as water-binding and gelling agents (in meat products, bakery products, etc.), for **protein** enrichment (e.g. in pasta products, beverage and biscuits), as structural agents (e.g. in

meat and fish substitutes) and for clarification of wines and fruit juices. Three fields of application are examined in detail, viz. meat and sausages; emulsified soups, sauces, etc.; and dairy products such as yoghurt, quarg, ice cream and processed cheese.

CC P (Milk and Dairy Products)

CT CLARIFICATION; FRUIT JUICES; **PROTEIN PRODUCTS**; **PROTEINS MILK**; WINES; FOODS; **MILK PROTEINS**

L7 ANSWER 7 OF 13 FSTA COPYRIGHT 2004 IFIS on STN

AN 1980(01):P0169 FSTA

TI **Protein** evaluation in growing rats of breast **milk** and breast **milk** substitutes with special reference to the content of non-**protein** nitrogen.

AU Forsum, E.; Loennerdal, B.

CS Inst. of Nutr., Univ. of Uppsala, Box 551, S-751 22, Uppsala, Sweden

SO Journal of Nutrition, (1979), 109 (2) 185-192, 30 ref.

DT Journal

LA English

AB **Protein** quality of human **milk** was compared with that of 2 infant formulae in a balance study on growing rats. The human **milk**, obtained from a **milk** bank, was defatted, pasteurized at 72° C for 15-30 s and concentrated by diafiltration to reduce the lactose content. Since this treatment also reduced the non-**protein** N (NPN) content, a synthetic NPN mixture (simulating that in human **milk**) was added to the **milk protein concentrate**. The commercial and modified infant formulae contained, resp., (i) 40% bovine casein and 60% bovine whey proteins and (ii) 40% of total N from bovine casein, 40% from bovine α-**lactalbumin** and 20% from NPN compounds. Human **milk** proteins with an added NPN mixture showed a lower **protein** quality than the 2 infant formulae and human **milk** without added NPN substances. Formula (i) had the highest biological value and net **protein** utilization. However, rat growth assays may not be appropriate for evaluation of infant foods, and formula (ii) may be more suitable for infants since it is similar to human **milk** in **protein** quality, amino acid balance and composition of individual proteins.

CC P (Milk and Dairy Products)

CT INFANT FOODS; **MILK**; NITROGEN; NUTRITIONAL VALUES; PROTEINS; **PROTEINS MILK**; **HUMAN MILK**; **HUMAN MILK SUBSTITUTES**; INFANT FORMULAE; INFANT FORMULAS; NITROGEN COMPOUNDS; **QUALITY # NON-PROTEIN N-CONTAINING**; QUALITY RAT ASSAYS; SUBSTITUTES

L7 ANSWER 8 OF 13 FROSTI COPYRIGHT 2004 LFRA on STN

AN 591460 FROSTI

TI Process for separation of whey proteins using a novel anion exchanger.

IN Ayers J.S.; Elgar D.F.; Palmano K.P.; Pritchard M.; Bhaskar G.V.

PA Massey University; New Zealand Dairy Board

SO UK Patent Application

PI GB 2372949 A
WO 2002041584 20010614

AI 20020607

PRAI New Zealand 19991208; 20000609

DT Patent

LA English

SL English

AB A technique is described for separating whey proteins from liquid dairy products. This is achieved with a novel anion exchanger incorporating crosslinked regenerated cellulose that is water-insoluble, hydrophilic, water swellable, hydroxy-C2-C4-alkylated (e.g. hydroxypropylated), and derivatized with quaternary ammonium groups. Ion exchangers that are prepared on this matrix are said to be resistant to attrition, to have

good **protein** capacity, to show superior flow properties, and to be available at relatively low cost. The starting solutions may be whole **milk**, skimmed **milk**, whey, **milk** or whey treated by ultrafiltration or microfiltration, reconstituted whey **protein concentrate** (WPC), or **milk protein concentrate** (MPC). The products are depleted in whey **protein**, particularly beta-**lactoglobulin**, and have improved heat stability. They have application in cheese manufacture.

SH DAIRY PRODUCTS

CT ANION EXCHANGE; CHEESE; CHEESEMAKING; CONCENTRATES; DAIRY PRODUCTS; HEAT STABILITY; ION EXCHANGE; **MILK PROTEIN**; **MILK** PROTEINS; PATENT; PRODUCTION; **PROTEIN**; **PROTEIN** CONCENTRATES; PROTEINS; STABILITY; UK PATENT; WHEY PRODUCTS; WHEY **PROTEIN**; WHEY **PROTEIN CONCENTRATE**; WHEY PROTEINS

DED 27 Sep 2002

L7 ANSWER 9 OF 13 FROSTI COPYRIGHT 2004 LFRA on STN

AN 559427 FROSTI

TI Process for separation of whey proteins using a novel anion exchanger.

IN Ayers J.S.; Elgar D.F.; Palmano K.P.; Pritchard M.; Bhaskar G.V.

PA Massey University; New Zealand Dairy Board

SO PCT Patent Application

PI WO 2001041584 A1

AI 20001208

PRAI New Zealand 19991208; 20000609

DT Patent

LA English

SL English

AB A technique is described for separating whey proteins from liquid dairy products. This is achieved with a novel anion exchanger incorporating cross-linked regenerated cellulose that is water-insoluble, hydrophilic, water swellable, hydroxy-C2-C4-alkylated (e.g. hydroxypropylated), and derivatized with quaternary ammonium groups. Ion exchangers that are prepared on this matrix are said to be resistant to attrition, to have good **protein** capacity, to show superior flow properties, and to be available at relatively low cost. The starting solutions may be whole **milk**, skimmed **milk**, whey, **milk** or whey treated by ultrafiltration or microfiltration, reconstituted whey **protein concentrate** (WPC), or **milk protein concentrate** (MPC). The products are depleted in whey **protein**, particularly beta-**lactoglobulin**, and have improved heat stability. They have application in cheese manufacture.

SH DAIRY PRODUCTS

CT ANION EXCHANGE; CHEESE; CHEESEMAKING; CONCENTRATES; DAIRY PRODUCTS; HEAT STABILITY; ION EXCHANGE; **MILK PROTEIN**; **MILK** PROTEINS; PATENT; PCT PATENT; PRODUCTION; **PROTEIN**; **PROTEIN** CONCENTRATES; PROTEINS; STABILITY; WHEY PRODUCTS; WHEY **PROTEIN**; WHEY **PROTEIN CONCENTRATE**; WHEY PROTEINS

DED 31 Jul 2001

L7 ANSWER 10 OF 13 FROSTI COPYRIGHT 2004 LFRA on STN

AN 554400 FROSTI

TI Dairy products.

AU Food Technology Intelligence Incorporated

SO Advances in nutritional and fat reduction technologies. (Revised edition), Published by: FTI Inc., Midland Park, 2001, 21-31 Food Technology Intelligence Incorporated

NTE REFERENCE ONLY

DT Book Article

LA English
AB An overview is given of some technological developments affecting the dairy field. The following developments are discussed: MicroLactin, a **milk protein concentrate** with antiinflammatory activity; a low-fat, low-sugar, vitamin-enriched **milk** shake; products based on bovine colostral antibodies for treatment of human gastrointestinal disease such as that caused by Helicobacter; use of colostrum immunoglobulins in functional foods; separation of whey proteins; anti-cancer activity of modified whey **protein**; separation of beta-**lactoglobulin** from whey; and a texturizer for use in reduced-fat cheese.
CT ANTIBODIES; ANTICARCINOGENS; ANTIINFLAMMATORY FOODS; BACTERIA; BASIC GUIDE; BETA **LACTOGLOBULIN**; BEVERAGES; CANCER; CHEESE; COLOSTRUM IMMUNOGLOBULINS; DAIRY PRODUCTS; DISEASES; ENZYMES; EXTRACTION; FUNCTIONAL FOODS; HEALTH BENEFITS; HEALTHY DAIRY PRODUCTS; HEALTHY **MILK** SHAKES; IMMUNE DAIRY PRODUCTS; IMMUNE ENHANCERS; IMMUNOGLOBULINS; INTESTINAL DISEASES; LACTOFERRIN; **LACTOGLOBULIN** ; LACTOPEROXIDASE; LOW FAT CHEESE; LOW FAT DAIRY PRODUCTS; LOW FAT FOODS; LOW FAT **MILK** SHAKES; MICROLACTIN; **MILK CONCENTRATE**; **MILK** DRINKS; **MILK PROTEIN**; **MILK** PROTEINS; **MILK** SHAKES; MODIFIED WHEY **PROTEIN**; NON ALCOHOLIC BEVERAGES; PATHOGENS; PROCESSING; PRODUCTION; **PROTEIN**; PROTEINS; TEXTURIZERS; WHEY PRODUCTS; WHEY **PROTEIN**
DED 7 Jun 2001

L7 ANSWER 11 OF 13 FROSTI COPYRIGHT 2004 LFRA on STN
AN 396748 FROSTI
TI Papain proteolysis of **milk protein concentrate**.
AU Lieske B.; Konrad G.
SO Deutsche Milchwirtschaft, 1995, 46 (21), 1174-1177 (14 ref.)
DT Journal
LA German
AB Enzymic hydrolysis of **milk** proteins is used in the production of diet foods and in the development of a more functional **milk protein** (achieved through proteolysis). The article describes tests to determine the effects of papain proteolysis in ultrafiltered whey **protein concentrate**, its molecular qualities and functionality. The article concludes that limited papain proteolysis is a possible way to achieve a natural foaming product. Hydrophobe peptide elements set free from beta-**lactoglobulin** improve the foaming qualities of whey **protein**. When these peptides are filtered with selective ultrafiltration (membrane with separation limit of 1000 Da), the emulsifying properties are even better.
SH DAIRY PRODUCTS
CT FOAMING; PAPAIN; PROTEINS; PROTEOLYSIS; WHEY; WHEY **PROTEIN**; WHEY PROTEINS
DED 13 Dec 1995

L7 ANSWER 12 OF 13 FROSTI COPYRIGHT 2004 LFRA on STN
AN 304610 FROSTI
TI Production, functional properties and utilization of **milk protein** products.
AU Mulvihill D.M.
SO Advanced dairy chemistry, vol. 1: proteins., Published by: Elsevier Applied Science Publishers Ltd, London, UK, 1992, 369-404 (54 ref.)
Fox P.F.
ISBN: 1-85166-761-X
DT Book Article
LA English
AB An overview of methods used for the production of dried **milk protein**-enriched products is presented in this chapter. The

production of caseins, caseinates, whey-**protein**-enriched products and **lactalbumin** is described in detail. The manufacture of co-precipitates and **milk protein concentrate** is also considered. The functional properties of **milk protein** products discussed include solubility, gelation and coagulation, hydration, viscosity, surface-active properties, and emulsifying and foaming properties. Finally, the following food uses of **milk protein** products are considered: bakery products; dairy products; beverages; dessert-type products; pasta products; confectionery; meat products; dietary, pharmaceutical and medical applications; convenience foods; and textured products.

SH DAIRY PRODUCTS

CT APPLICATIONS; CASEIN; CASEINATES; DRIED; DRIED **MILK**; DRIED **PROTEIN**; DRIED PROTEINS; DRIED WHEY; FOOD INDUSTRY; FUNCTIONAL; FUNCTIONAL PROPERTIES; **MILK**; **MILK PROTEIN**; **MILK** PROTEINS; PRODUCTION; PROPERTIES; PROTEINS; WHEY; WHEY **PROTEIN**; WHEY PROTEINS

DED 16 Feb 1993

L7 ANSWER 13 OF 13 FROSTI COPYRIGHT 2004 LFRA on STN

AN 286105 FROSTI

TI Trends in the production and utilisation of dairy **protein** products: production.

AU Mulvihill D.M.

SO CSIRO Food Research Quarterly, 1991, 51 (3/4), 145-57 (16 ref.)

DT Journal

LA English

AB Casein and **whey** proteins are isolated by exploiting differences in their characteristics. They can also be isolated together as co-precipitates in high-**protein** products. Methods are now being developed for the fractionation of individual proteins with industrial-scale possibilities. This article describes the production of caseins; methods for the manufacture of caseinates; casein and co-precipitate isolation; industrial-scale fractionation of caseins; the production of **whey protein**-enriched products; **whey** powders; **whey protein concentrate** and **isolate** production; **lactalbumin** production; fractionation of **whey** proteins; co-precipitate production and **milk protein concentrate** production.

SH DAIRY PRODUCTS

CT CASEIN; CASEINATES; FRACTIONATION; **LACTALBUMIN**; **MILK**; **MILK PROTEIN**; **MILK** PROTEINS; PROCESSING; PRODUCTION; PROTEINS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 15 May 1992

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=> d his

     (FILE 'HOME' ENTERED AT 08:06:40 ON 16 SEP 2004)

     FILE 'FSTA, FROSTI' ENTERED AT 08:06:49 ON 16 SEP 2004
L1         4825 S LACTALBUMIN OR LACTOGLOBULIN OR SIALYLLACTOSE
L2         3772 S (MILK AND PROTEIN AND CONCENTRATE) OR (WHEY AND PROTEIN AND I
L3          374 S L1 AND L2
L4            0 S (MILK ADJ1 PROTEIN ADJ1 CONCENTRATE) OR (WHEY ADJ1 PROTEIN AD
L5          265 S MILK PROTEIN CONCENTRATE
L6          997 S WHEY PROTEIN ISOLATE
L7           13 S L3 AND L5

=> s l3 and l6
```

L8 191 L3 AND L6

=> s milk/ti
L9 52950 MILK/TI

=> s l8 and l9
L10 9 L8 AND L9

=> d 1-9 all

L10 ANSWER 1 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1692 FSTA
TI Heat-induced aggregation of **milk protein**-stabilized emulsions: sensitivity to processing and composition.
AU Dickinson, E.; Parkinson, E. L.
CS Procter Dep. of Food Sci., Univ. of Leeds, Leeds LS2 9JT, UK. Fax +44-1132-332-982. E-mail e.dickinson(a)leeds.ac.uk
SO International Dairy Journal, (2004), 14 (7) 635-645, 30 ref.
ISSN: 0958-6946
DT Journal
LA English
AB Heat stability was studied in model systems of oil-in-water emulsions, pH 6.8, prepared with commercial **whey protein isolate** as emulsifying agent (2 or 3 weight%) and n-tetradecane as the oil phase (30 or 45 volume%). Samples were heated for up to 48 h at 70-90'b0C, and changes in viscosity and particle-size distribution were determined. Influence on heat-induced aggregation of **protein** /oil ratio, source of **whey protein**, use of β-**lactoglobulin** (β-LG) instead of **whey protein**, partial replacement of **whey protein** by sodium caseinate, pH and ionic strength was examined. Results showed that substitution of just 10% pure β-LG by caseinate in a heat-sensitive emulsion conferred stability for many hours at 90'b0C. A commercial **whey protein** that gave unflocculated emulsions at room temperature exhibited time-dependent heat-induced thickening behaviour after heating for a few minutes at >70'b0C. Under well-defined conditions, a maximum in apparent viscosity with heating time was observed, whose magnitude was sensitive to the extent and duration of shearing. Replacement of just 5% **whey protein** by caseinate in this emulsion completely eliminated this heat-induced viscosity maximum It is concluded that a very small proportion of casein may have a marked influence on the heat stability of a **whey protein** -based emulsion. A physicochemical mechanism is proposed to explain this behaviour, based on the additional steric stabilization conferred by a low density of dangling casein tails.
CC P (Milk and Dairy Products)
CT CASEINATES; EMULSIONS; LACTOGLOBULINS; PH; PHYSICAL PROPERTIES; THERMOPHYSICAL PROPERTIES; **WHEY**; **Nb -LACTOGLOBULIN**; HEAT STABILITY; IONIC STRENGTH; MODELLING; SODIUM CASEINATE; **WHEY PROTEINS**

L10 ANSWER 2 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 2000(11):P1794 FSTA
TI Renneting properties of transglutaminase-treated **milk**.
AU Lorenzen, P. C.
CS Fed. Dairy Res. Cent. Kiel, Inst. for Chem. & Physics, Hermann-Weigmann-Str. 1, 24103 Kiel, Germany
SO Milchwissenschaft, (2000), 55 (8) 433-437, 22 ref.
ISSN: 0026-3788
DT Journal
LA English
AB Renneting properties of transglutaminase (**protein**-glutamine γ-glutamyltransferase)-treated milk were studied. Renneting ability

of milk decreased with increasing degree of crosslinking. Increased crosslinking was a result of increased heat impact and incubation time with transglutaminase, respectively. High heating of milk (92°C, 5 min) followed by enzyme treatment led to complete loss of renneting ability. Contents of sialic acid decreased linearly when high-heated milk was mixed with an increasing amount of high-heated and transglutaminase-treated (40°C, 120 min) milk. Model examinations using calcium caseinate and **whey protein isolate** as substrates were performed to analyse the mechanism of the decreased renneting ability. It is assumed that loss of renneting ability of transglutaminase-treated milk is induced by 'rface sealing' of casein micelles with cross-linked **whey** proteins, especially β- **lactoglobulin**. Additionally, the model investigations showed that rennet gels from transglutaminase-treated calcium caseinate dispersions have a different structure and consistency as well as appearance from rennet gels from untreated caseinate.

CC P (Milk and Dairy Products)

CT COAGULATION; MILK; TRANSFERASES; **PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES**; RENNETABILITY

L10 ANSWER 3 OF 9 FSTA COPYRIGHT 2004 IFIS on STN

AN 1998(07):P1207 FSTA

TI Gel formation from industrial **milk whey** proteins under hydrostatic pressure: effect of hydrostatic pressure and **protein** concentration.

AU Kanno, C.; Tai-Hau Mu; Hagiwara, T.; Ametani, M.; Azuma, N.

CS Dep. of Applied Biochem., Utsunomiya Univ., Utsunomiya 321, Japan. Tel. & Fax +81-28-649-5461. E-mail kanno(a)cc.utsunomiya-u.ac.jp

SO Journal of Agricultural and Food Chemistry, (1998), 46 (2) 417-424, 34 ref.
ISSN: 0021-8561

DT Journal

LA English

AB The effects of high hydrostatic pressure and **protein** concentration on the denaturation and gelation of **whey protein** were investigated. Industrial **whey protein isolate** (WPI) and **whey protein concentrate** (WPC) solutions (pH 6.8) at various concentration were pressurized for 10 min at 30°C under 200-1000 MPa. With the WPI solution, the concentration for affecting the turbidity was 1% and was 6% for the viscosity at 400 MPa, while for inducing gelation, it was 10% at 600 MPa. With the WPC solution, the viscosity changed at a concentration >12%, and gel formation began at >18% at 400 MPa. The hardness and breaking stress of pressure-induced WPI gels increased with increasing concentration of WPI (12-18%) and hydrostatic pressure, the ratings for the 20% WPC gels being one-third those of the 20% WPI gels. The solubility of proteins from the pressure-induced WPI gels decreased with increasing pressure, while that of WPC gel induced at >600 MPa remained constant at approx. 50%. The microstructure of the WPI gels had a porous network form, whereas the WPC gels were irregular particulates. β- **Lactoglobulin**, α- **lactalbumin** and serum albumin preferentially participated in pressure-induced aggregation and gelation through S-S bonding.

CC P (Milk and Dairy Products)

CT GELATION; PRESSURE; **PROTEINS MILK**; **WHEY**; **WHEY PROTEINS**

L10 ANSWER 4 OF 9 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(02):G0049 FSTA

TI Characterization of polymers produced by cross-linking soybean 11S globulin with **milk whey** proteins using transglutaminase.

AU Yildirim, M.; Hettiarachchy, N. S.; Kalapathy, U.
CS United States of America, Institute of Food Technologists 1996 Annual Meeting; Dep. of Food Sci., Univ. of Arkansas, Fayetteville, AR 72704, USA
SO (1996), 1996 IFT annual meeting: book of abstracts, p. 120 ISSN 1082-1236 ISSN: 1082-1236
DT Conference
LA English
AB Synthesis and characterization of **protein** polymers formed by cross-linking of proteins with transglutaminase are described. The proteins used were purified soybean 11S globulin, crude **whey protein isolate** (WPI), and α- **lactalbumin** and β- **lactoglobulin** purified from WPI. Pairs of proteins were cross-linked at 37°C, pH 7.5 using 0.04 U of guinea pig transglutaminase/mg **protein**. Reaction mixtures were sampled at 30-240 min, and **protein** polymers were analysed by electrophoresis, DSC and HPLC. 11S globulin formed polymers with WPI and the 2 individual **whey** proteins. The polymers were stable up to 80°C, had better thermal stability than WPI and exhibited similar stability to that of 11S globulin. [From En summ. Further abstracts of presentations from this meeting are covered in electronic formats of the FSTA database and may be traced via the corporate authors (CA) field, under United States of America, Institute of Food Technologists [1996 Annual Meeting]. See also FSTA (1996) 28 11A2.]
CC G (Catering, Speciality and Multicomponent Foods)
CT DAIRY PRODUCTS; ENZYMES; POLYMERS; PROTEINS; PROTEINS MILK; SOY PROTEINS; TRANSFERASES; **WHEY**; TRANSGLUTAMINASES; **WHEY PROTEINS**

L10 ANSWER 5 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 1988(10):G0031 FSTA
TI Creaming stability of fluid emulsions containing different **milk protein** preparations.
AU Leman, J.; Haque, Z.; Kinsella, J. E.
CS Inst. of Food Sci., Cornell Univ., Ithaca, NY 14853, USA
SO Milchwissenschaft, (1988), 43 (5) 286-289, 26 ref. ISSN: 0026-3788
DT Journal
LA English
SL German
AB Effects of pH, ionic strength, **protein** concentration, energy input and heat treatment on creaming stability of emulsions made with whole milk proteins (MP), β- **lactoglobulin** (β-Lg), **whey protein isolate** (WPI) and micellar casein (MC) were studied at an oil:water ratio of 4:6. Increasing the energy input using a single-piston recirculating homogenizer improved emulsion stability. More stable emulsions were obtained as **protein** concentration were increased from 1 to 3% and, in the pH range 6-9, stability was lowest at pH 6. Under the conditions used β-Lg formed emulsions with best creaming stability, the order being β-Lg > WPI > MP > MC. Emulsions were stable following heating at 70 or 80°C for 5-20 min.
CC G (Catering, Speciality and Multicomponent Foods)
CT CREAM; DAIRY PRODUCTS; EMULSIONS; MILK; PROTEINS; PROTEINS MILK; STABILITY; CREAMING; MILK EMULSIONS; MILK PROTEINS

L10 ANSWER 6 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN
AN 643020 FROSTI
TI What's so good about **milk**?
AU Deeprose J.
SO International Food Ingredients, 2004, (June-July), (3), 36+38 (0 ref.) Published by: http://www.ifi-online.com ISSN: 0924-5863
DT Journal
LA English
AB Applications of **milk** derivatives and ingredients in the food

processing industry are discussed. **Whey protein** concentrates with a **protein** content of more than 80% can give good gelling and water-binding in the preparation of meat products. Hiprotal 580HG is a new **whey protein concentrate** containing high levels of beta-**lactoglobulin** that can be used to improve the texture, taste and nutritional value of food products. Domvictus, a **concentrate** range with lower **protein** levels, includes 835MP modified to enhance the fat impression in low-fat yoghurts and 535 described as a functional ingredient for gelling. Casein and caseinates are used for emulsifying and stabilising nutritional drinks. Caseino glycomacropeptide (CGMP), a bioactive peptide made from sweet **whey**, appears to have potential as a prebiotic in functional food. Functional properties and applications of **milk protein** isolates and **whey protein** concentrates are described. Research into the health benefits of **whey** proteins have resulted in a new generation of functional foods, focusing on the bioactive properties of ingredients. Casein and **whey** proteins can be degraded, fermented, isolated and concentrated, giving functional peptides that behave differently. EMSER is a high **protein milk** derivative used as an emulsifier/stabiliser in meat products. The **milk protein** fraction Try-Pro is claimed to enhance serotonin secretion.

SH PROTEINS

CT APPLICATIONS; BIOACTIVE PEPTIDES; CASEIN; CASEINATES; DAIRY PRODUCTS; FUNCTIONAL FOODS; FUNCTIONAL INGREDIENTS; FUNCTIONAL PROPERTIES; INGREDIENTS; **MILK PROTEIN**; **MILK** PROTEINS; PEPTIDES; **PROTEIN**; PROTEINS; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**

DED 16 Jul 2004

L10 ANSWER 7 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN

AN 537831 FROSTI

TI **Milk** proteins.

AU Ennis M.P.; Mulvihill D.M.

SO Handbook of hydrocolloids., Published by: Woodhead Publishing Ltd, Cambridge, 2000, 189-217 (42 ref.)
Phillips G.O.; Williams P.A.
ISBN: 1-85573-501-6

DT Book Article

LA English

AB **Milk** proteins are useful food additives because of their high nutritional value and functional properties. An overview of **milk** proteins is provided. Consideration is given to the composition of **milk** and the distribution of proteins in **milk**; the manufacture of **milk protein** products (e.g. caseins, caseinates, the fractionation of caseins, **whey** powders and modified **whey** powders, **whey protein concentrate**, **whey protein isolate**, **lactalbumin** and the fractionation of **whey** proteins); functional properties (solubility, gelation, coagulation, hydration, viscosity, and surface active, emulsifying and foaming properties) of **milk protein** products; applications (in bakery products, dairy products, beverages, desserts, pasta products, confectionery, meat products, convenience foods, textured products, films and coatings); and future developments. Tables and figures supplement the text.

SH ADDITIVES

CT APPLICATIONS; CASEIN; CASEINATES; COMPOSITION; DAIRY PRODUCTS; FUNCTIONAL PROPERTIES; HYDROCOLLOIDS; **MILK PROTEIN**; **MILK PROTEIN** PRODUCTS; **MILK** PROTEINS; PRODUCTION; **PROTEIN**; **PROTEIN** PRODUCTS; PROTEINS; REVIEW;

RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; VISCOSITY; **WHEY** PRODUCTS
DED 23 Nov 2000

L10 ANSWER 8 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN
AN 505592 FROSTI
TI Fractionation of **milk** proteins.
AU Maubois J.-L.
SO Proceedings of the 25th International Dairy Congress, Aarhus, September 1998. Volume 2: dairy science and technology., Published by: Danish National Committee of the IDF, Aarhus, 1999, 74-86 (35 ref.)
Danish National Committee of the IDF
ISBN: 87-89795-82-2
DT Conference Article
LA English
AB There is increasing interest in the use of separated milk proteins in functional foods and nutraceutical products. The dairy industry has developed advanced procedures for the separation of milk proteins. In this chapter, the basic principles of the separation of milk proteins are explained, and recent advances in the separation and purification of proteins from fluid milk are reviewed. Methods of controlling microbial growth during **protein** separations are mentioned and include chilling, membrane microfiltration, and more recently, two microfilters in cascade, dynamic membrane filtration, and improved ceramic membranes. The chapter then reviews developments in the preparation of micellar casein and **whey protein** isolates (an integrated **protein** extraction process), beta-**lactoglobulin**, and kappa-glycomacropeptide (and antithrombic peptides). Figure are presented that illustrate the steps involved in milk-**protein** separation, the preparation of beta-**lactoglobulin**, and the manufacture of glycomacropeptide.
SH DAIRY PRODUCTS
CT BETA **LACTOGLOBULIN**; CASEIN; DAIRY PRODUCTS; EXTRACTION; KAPPA GLYCOMACROPEPTIDE; **LACTOGLOBULIN**; MEMBRANES; MILK; MILK PROTEINS; PRODUCTION; PROTEINS; PURIFICATION; SEPARATION; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**
DED 21 Oct 1999

L10 ANSWER 9 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN
AN 191192 FROSTI
TI Preaning stability of fluid emulsions containing different **milk protein** preparations.
AU Leman J.; Haque Z.; Kinsella J.E.
SO Milchwissenschaft, 1988, 43 (5), 286-9 (26 ref.)
DT Journal
LA English
SL English; German
AB Emulsions were prepared from skimmed milk proteins, beta-**lactoglobulin**, **whey protein isolate** and micellar casein at an oil/water ratio of 4:6 using a single piston valve homogeniser. The effects of pH, ionic strength, **protein** concentration, energy input and heat treatment on the relative stability of the emulsions was investigated. Emulsion stability depended upon the amount and type of **protein** adsorbed onto the dispersed phase globule surface. This was affected by the concentration of **protein** in dispersion, pH and emulsifying time.
CT CONCENTRATION; CREAMING; EMULSIFICATION; EMULSIFYING CAPACITY; EMULSIFYING PROPERTIES; EMULSIONS; EVALUATION; FACTORS AFFECTING; HEAT STABILITY; HEATING; HOMOGENIZATION; IONS; MILK **PROTEIN**; MILK PROTEINS; OIL EMULSIONS; PH; POWER; PROPERTIES; PROTEINS; STABILITY; TYPE; WATER EMULSIONS
DED 25 Oct 1988

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=> d his

     (FILE 'HOME' ENTERED AT 08:06:40 ON 16 SEP 2004)

     FILE 'FSTA, FROSTI' ENTERED AT 08:06:49 ON 16 SEP 2004
L1          4825 S LACTALBUMIN OR LACTOGLOBULIN OR SIALYLLACTOSE
L2          3772 S (MILK AND PROTEIN AND CONCENTRATE) OR (WHEY AND PROTEIN AND I
L3           374 S L1 AND L2
L4             0 S (MILK ADJ1 PROTEIN ADJ1 CONCENTRATE) OR (WHEY ADJ1 PROTEIN AD
L5           265 S MILK PROTEIN CONCENTRATE
L6           997 S WHEY PROTEIN ISOLATE
L7            13 S L3 AND L5
L8           191 S L3 AND L6
L9         52950 S MILK/TI
L10            9 S L8 AND L9

=> d l8/ti
'L24' MUST END IN '/Q', '/A', '/L', '/S' OR '/B'
The saved name for a query (or structure or screen set) must end with
'/Q'.  The saved name for an answer set must end with '/A'.  The saved
name for an L# list must end with '/L'.  SDI request names must end
with '/S'.  To see a list of all saved query, answer set,, and L# list
names for this loginid, enter "DISPLAY SAVED" at an arrow
prompt (=>).  Enter "DISPLAY SAVED/S" to see a list of SDI request
names.  Enter "DISPLAY SAVED/B" to see a list of BATCH search
requests.

=> d l8 1-191 ti

L8   ANSWER 1 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Fractionation of proteins from whey using cation exchange
     chromatography.

L8   ANSWER 2 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   A two-stage ultrafiltration process for fractionation of whey
     protein isolate.

L8   ANSWER 3 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Sustained improver of muscular fatigue.

L8   ANSWER 4 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Heat-induced changes in the ultrasonic properties of whey
     proteins.

L8   ANSWER 5 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Heat-induced aggregation of milk protein-stabilized emulsions:
     sensitivity to processing and composition.

L8   ANSWER 6 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Separation and characterization of β- lactoglobulin and
     α- lactalbumin from whey and whey
     protein preparations.

L8   ANSWER 7 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Influence of stabilizing bonds on the texture properties of
     high-pressure-induced whey protein gels.

L8   ANSWER 8 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Immunomodulating effects of whey proteins and their enzymatic
     digests.

L8   ANSWER 9 OF 191  FSTA  COPYRIGHT 2004 IFIS on STN
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TI Fractionation of **whey** proteins by bipolar membrane electroacidification.

L8 ANSWER 10 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effect of processing on the displacement of **whey** proteins: applying the orogenic model to a real system.

L8 ANSWER 11 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI **Whey protein isolate** and α-**lactalbumin** recovery from lactic acid **whey** using cation-exchange chromatography.

L8 ANSWER 12 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Use of multi-angle laser light scattering and size-exclusion chromatography to characterize the molecular weight and types of aggregates present in commercial **whey protein** products.

L8 ANSWER 13 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Influence of κ-carrageenan on the aggregation behaviour of proteins in heated **whey protein isolate** solutions.

L8 ANSWER 14 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effect of pre-heating on the foaming properties of **whey protein isolate** using a membrane foaming apparatus.

L8 ANSWER 15 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Mineral modulation of thermal aggregation and gelation of **whey** proteins: from β- **lactoglobulin** model system to **whey protein isolate**.

L8 ANSWER 16 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Influence of sugar moiety (rhamnosylglucoside) at 3-O position on the reactivity of quercetin with **whey** proteins.

L8 ANSWER 17 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Optimizing stability of orange juice fortified with **whey protein** at low pH values.

L8 ANSWER 18 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Assessment of the reactivity of selected isoflavones against proteins in comparison to quercetin.

L8 ANSWER 19 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Characterization of soluble aggregates from **whey protein isolate**.

L8 ANSWER 20 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI **Whey protein isolate** and glycomacropeptide recovery from **whey** using ion exchange chromatography.

L8 ANSWER 21 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Heat-induced gelation of **whey** proteins by rheology, atomic force microscopy, and Raman scattering spectroscopy.

L8 ANSWER 22 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI [Effect of temperature on **whey protein** isolated (WPI) films adsorbed at the water-oil interface.]

L8 ANSWER 23 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI The compositional and nutritional properties of **whey protein isolate**.

L8 ANSWER 24 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Principal component similarity analysis of Raman spectra to study the effects of pH, heating, and κ-carrageenan on **whey protein** structure.

L8 ANSWER 25 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Impact of **whey protein** emulsifiers on the oxidative stability of salmon oil-in-water emulsions.

L8 ANSWER 26 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Viscous properties of taro flour extruded with **whey** proteins to simulate weaning foods.

L8 ANSWER 27 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Physical and chemical interactions in cold gelation of food proteins.

L8 ANSWER 28 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effects of storage time and temperature on the solubility of **whey protein isolate**.

L8 ANSWER 29 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Studies of the binding of α- **lactalbumin** to immobilized peptide ligands.

L8 ANSWER 30 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Mechanical characterization of network formation during heat-induced gelation of **whey protein** dispersions.

L8 ANSWER 31 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI New biological function of bovine α- **lactalbumin**: protective effect against ethanol- and stress-induced gastric mucosal injury in rats.

L8 ANSWER 32 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Rheological characterization of a gel formed during extensive enzymatic hydrolysis.

L8 ANSWER 33 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Texture and structure of some globular **protein** gels.

L8 ANSWER 34 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Application of PRODAN fluorescent probe to measure surface hydrophobicity of proteins interacting with κ-carrageenan.

L8 ANSWER 35 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Flavor release.

L8 ANSWER 36 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Separation of bovine immunoglobulin G and glycomacropeptide from dairy **whey**.

L8 ANSWER 37 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effect of partial hydrolysis with an immobilized proteinase on thermal gelation properties of β- **lactoglobulin** B.

L8 ANSWER 38 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Oxidatively induced chemical changes and interactions of mixed myosin, β- **lactoglobulin** and soy 7S globulin.

L8 ANSWER 39 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Renneting properties of transglutaminase-treated milk.

L8 ANSWER 40 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

TI Mechanical properties and microstructure of heat-set **whey protein** emulsion gels: effect of emulsifiers.

L8 ANSWER 41 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Protease-induced gelation of unheated and heated **whey** proteins: effects of pH, temperature, and concentrations of **protein**, enzyme and salts.

L8 ANSWER 42 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Comparison of **protein** surface hydrophobicity measured at various pH values using three different fluorescent probes.

L8 ANSWER 43 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Interfacial ageing effect on the rheology of a heat-set **protein** emulsion gel.

L8 ANSWER 44 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Adsorption of **whey protein isolate** at the oil-water interface as a function of processing conditions: a rheokinetic study.

L8 ANSWER 45 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Modification of rheological properties of **whey protein** isolates by limited proteolysis.

L8 ANSWER 46 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Mechanical properties, water vapor permeability, and moisture contents of β- **lactoglobulin** and **whey protein** films using multivariate analysis.

L8 ANSWER 47 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Gel characteristics of β- **lactoglobulin**, **whey protein concentrate** and **whey protein isolate**.

L8 ANSWER 48 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Gel formation from industrial **milk whey** proteins under hydrostatic pressure: effect of hydrostatic pressure and **protein** concentration.

L8 ANSWER 49 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Aggregate formation during hydrolysis of β- **lactoglobulin** with a Glu and Asp specific protease from Bacillus licheniformis.

L8 ANSWER 50 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI **Whey** to go.

L8 ANSWER 51 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Micro-scale method for determining foaming properties of **protein**
.

L8 ANSWER 52 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI The effects of CaCl.sub.2 on aggregation of **whey** proteins.

L8 ANSWER 53 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Binding of retinoids to β- **lactoglobulin** isolated by bioselective adsorption.

L8 ANSWER 54 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Thermal stabilization of β- **lactoglobulin** by **whey** peptide fractions.

L8 ANSWER 55 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

TI Biopolymers produced by cross-linking soybean 11S globulin with **whey** proteins using transglutaminase.

L8 ANSWER 56 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Enzymatic cross-linking of **whey** proteins by a Ca.sup.2.sup.+-independent microbial transglutaminase from Steptomyces lydicus.

L8 ANSWER 57 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Mass transfer properties of **whey protein** films and their effect on the rancidity process of dry nuts.

L8 ANSWER 58 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Comparison of oxygen and water vapor permeabilities of **whey protein isolate** and β- **lactoglobulin** edible films.

L8 ANSWER 59 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Oil-in-water emulsions stabilized by sodium caseinate or **whey protein isolate** as influenced by glycerol monostearate.

L8 ANSWER 60 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Characterization of polymers produced by cross-linking soybean 11S globulin with milk **whey** proteins using transglutaminase.

L8 ANSWER 61 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effects of ionic strength on the solubility of **whey protein** products. A colloid chemical approach.

L8 ANSWER 62 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI The effect of the presence of KCl on the adsorption behaviour of **whey protein** and caseinate in oil-in-water emulsions.

L8 ANSWER 63 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Studies on the electrostatic interactions of lysozyme with α- **lactalbumin** and β- **lactoglobulin**.

L8 ANSWER 64 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Studies on available utilization of **whey** proteins. IV. Effect of preheating at high temperature under vacuum on physical properties of heat-induced **whey protein isolate** gels.

L8 ANSWER 65 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Studies on available utilization of **whey** proteins. III. Effect of preheating at high temperature under vacuum on heat aggregation of **whey protein isolate**.

L8 ANSWER 66 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Kinetics of thermal denaturation of β- **lactoglobulin** (β-Lg) as determined by fast **protein** liquid chromatography (FPLC).

L8 ANSWER 67 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI β- **Lactoglobulin** separation from **whey protein isolate** on a large scale.

L8 ANSWER 68 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effect of pH on the stability and surface composition of emulsions made with **whey protein isolate**.

L8 ANSWER 69 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Oscillatory rheological comparison of the gelling characteristics of egg white, **whey protein** concentrates, **whey**

protein isolate, and β- **lactoglobulin**.

L8 ANSWER 70 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effect of heat treatments in very acidic conditions on **whey protein isolate** properties.

L8 ANSWER 71 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Heat-induced gel formation of β- **lactoglobulin**: a study on the secondary and tertiary structure as followed by circular dichroism spectroscopy.

L8 ANSWER 72 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effect of pH during heat processing of partially hydrolyzed **whey protein**.

L8 ANSWER 73 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Polymerization of **whey** proteins in **whey protein**-stabilized emulsions.

L8 ANSWER 74 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI [The effect of α- **lactalbumin** and β- **lactoglobulin** on texturization of rennet casein.]

L8 ANSWER 75 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Gel point of **whey** and egg **protein** using dynamic rheological data.

L8 ANSWER 76 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI A micro-scale method for measuring the hardness of heat-induced **protein** gels.

L8 ANSWER 77 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Microcoagulation of a **whey protein isolate** by extrusion cooking at acid pH.

L8 ANSWER 78 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Trends in the production & utilisation of dairy **protein** products: production.

L8 ANSWER 79 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Changes in gelling behavior of **whey protein isolate** and β- **lactoglobulin** during storage: possible mechanism(s).

L8 ANSWER 80 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Mechanism of urea-induced **whey protein** gelation.

L8 ANSWER 81 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI pH and heat treatment effects on foaming of **whey protein isolate**.

L8 ANSWER 82 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Reduction of Streptococcus thermophilus in a **whey protein isolate** by low moisture extrusion cooking without loss of functional properties.

L8 ANSWER 83 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI [Studies on elimination of β- **lactoglobulin** from **whey** using carboxymethyl cellulose cation exchanger. Effects of pH and desalting of **whey** on fractionation of β- **lactoglobulin**.]

L8 ANSWER 84 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

TI Sulfhydryl group/disulfide bond interchange reactions during heat-induced gelation of **whey protein isolate**.

L8 ANSWER 85 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Effects of lysozyme, clupeine, and sucrose on the foaming properties of **whey protein isolate** and β-**lactoglobulin**.

L8 ANSWER 86 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Creaming stability of fluid emulsions containing different milk **protein** preparations.

L8 ANSWER 87 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI Functional properties of heat-denatured **whey** proteins. II. Emulsification and foaming properties.

L8 ANSWER 88 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
TI High purity **protein** recovery.

L8 ANSWER 89 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Heat-induced changes in the ultrasonic properties of **whey** proteins.

L8 ANSWER 90 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Soluble complexes of gum arabic with alpha -**lactalbumin** and beta lacto globulin above the **protein** isoelectric point: analysis in terms of charge patches.

L8 ANSWER 91 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI What's so good about **milk**?

L8 ANSWER 92 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Sustained improver of muscular fatigue.

L8 ANSWER 93 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Heat treatment of **whey** proteins in the presence of anionic surfactants.

L8 ANSWER 94 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Separation and characterization of beta-**lactoglobulin** and alpha-**lactalbumin** from **whey** and **whey protein** preparations.

L8 ANSWER 95 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Influence of stabilizing bonds on the texture properties of high-pressure-induced **whey protein** gels.

L8 ANSWER 96 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI **Whey protein isolate** and alpha-**lactalbumin** recovery from lactic acid **whey** using cation-exchange chromatography.

L8 ANSWER 97 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of processing on the displacement of **whey** proteins: applying the orogenic model to a real system.

L8 ANSWER 98 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Cross-linking and rheological changes of **whey** proteins treated with microbial transglutaminase.

L8 ANSWER 99 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Immunomodulating effects of **whey** proteins and their enzymatic digests.

L8 ANSWER 100 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Influence of kappa-carrageenan on the aggregation behaviour of proteins in heated **whey protein isolate** solutions.

L8 ANSWER 101 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Living nutrition. (Undenatured **whey protein isolate** containing active lactoferrin.)

L8 ANSWER 102 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Use of multi-angle laser light scattering and size-exclusion chromatography to characterize the molecular weight and types of aggregates present in commercial **whey protein** products.

L8 ANSWER 103 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of pre-heating on the foaming properties of **whey protein isolate** using a membrane foaming apparatus.

L8 ANSWER 104 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Mineral modulation of thermal aggregation and gelation of **whey** proteins: from beta-**lactoglobulin** model system to **whey protein isolate**.

L8 ANSWER 105 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Separation technologies to produce dairy ingredients.

L8 ANSWER 106 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Characterization of soluble aggregates from **whey protein isolate**.

L8 ANSWER 107 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Suppression of depletion flocculation in oil-in-water emulsions: a kinetic effect of beta-**lactoglobulin**.

L8 ANSWER 108 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Heat-induced gelation of **whey** proteins observed by rheology, atomic force microscopy and Raman scattering spectroscopy.

L8 ANSWER 109 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Impact of **whey protein** emulsifiers on the oxidative stability of salmon oil-in-water emulsions.

L8 ANSWER 110 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of temperature on **whey protein** isolated (WPI) films adsorbed at the water-oil interface.

L8 ANSWER 111 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Principal component similarity analysis of Raman spectra to study the effects of pH, heating, and kappa-carrageenan on **whey protein** structure.

L8 ANSWER 112 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Expanding the frontiers in separation technology.

L8 ANSWER 113 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Viscous properties of taro flour extruded with **whey** proteins to simulate weaning foods.

L8 ANSWER 114 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Physical and chemical interactions in cold gelation of food proteins.

L8 ANSWER 115 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

TI Effects of sucrose and sorbitol on the gel formation of a **whey protein isolate**.

L8 ANSWER 116 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Exchange reactions between **whey** proteins and caseins in heated soya oil-in-water emulsion systems - overall aspects of the reaction.

L8 ANSWER 117 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Exchange reactions between **whey** proteins and caseins in heated soya oil-in-water emulsion systems - behaviour of individual proteins.

L8 ANSWER 118 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Process for recovering proteins from **whey protein** containing feedstocks.

L8 ANSWER 119 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Tensile and barrier properties of edible films made from **whey** proteins.

L8 ANSWER 120 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Rheology, texture and microstructure of **whey** proteins/low methoxy pectins mixed gels with added calcium.

L8 ANSWER 121 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Studies of the binding of alpha-**lactalbumin** to immobilized peptide ligands.

L8 ANSWER 122 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Spreading the health.

L8 ANSWER 123 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Pressure-induced denaturation of monomer beta-**lactoglobulin** is partially irreversible: comparison of monomer form (highly acidic pH) with dimer form (neutral pH).

L8 ANSWER 124 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Rheological characterization of a gel formed during extensive enzymatic hydrolysis.

L8 ANSWER 125 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Putting proteins to work.

L8 ANSWER 126 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Molecular self-assembly of partially hydrolysed alpha-**lactalbumin** resulting in strong gels with a novel microstructure.

L8 ANSWER 127 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI New biological function of bovine alpha-**lactalbumin**: protective effect against ethanol- and stress-induced gastric mucosal injury in rats.

L8 ANSWER 128 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Fractionation of high-value **whey** proteins.

L8 ANSWER 129 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Application of PRODAN fluorescent probe to measure surface hydrophobicity of proteins interacting with kappa-carrageenan.

L8 ANSWER 130 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Plasticizer effect on oxygen permeability of beta-**lactoglobulin** films.

L8 ANSWER 131 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

TI Separation of bovine immunoglobulin G and glycomacropeptide from dairy **whey**.

L8 ANSWER 132 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of partial hydrolysis with an immobilized proteinase on thermal gelation properties of beta-**lactoglobulin** B.

L8 ANSWER 133 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effects of lipid on **whey protein** gelation.

L8 ANSWER 134 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Dry **whey** an alternative to gum arabic.

L8 ANSWER 135 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Cost-effective recovery of **whey** proteins.

L8 ANSWER 136 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Functional properties of the **whey protein** fractions produced in pilot scale processes. Foaming, water-holding capacity and gelation.

L8 ANSWER 137 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI **Milk** proteins.

L8 ANSWER 138 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Rapid Visco Analysis of dairy ingredients.

L8 ANSWER 139 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Gelation of **whey protein** induced by proteolysis or high pressure treatment.

L8 ANSWER 140 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Simultaneous separation and quantitation of the major bovine **whey** proteins including proteose peptone and caseinomacropeptide by reversed-phase high-performance liquid chromatography on polystyrene-divinylbenzene.

L8 ANSWER 141 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Comparison of **protein** surface hydrophobicity measured at various pH values using three different fluorescent probes.

L8 ANSWER 142 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Some physico-chemical properties of nine commercial and semi-commercial **whey protein** concentrates, isolates and fractions.

L8 ANSWER 143 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Interfacial ageing effect on the rheology of a heat-set **protein** emulsion gel.

L8 ANSWER 144 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Fractionation of milk proteins.

L8 ANSWER 145 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Functional properties of proteins and lipids: developed from a symposium, Cancun, November 1997.

L8 ANSWER 146 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Limited proteolysis of alpha-**lactalbumin** and **whey protein isolate**: effect on their functional properties.

L8 ANSWER 147 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Milking the nutrition market.

L8 ANSWER 148 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Sepralac process for the separation of **whey** proteins.

L8 ANSWER 149 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI The importance of **whey protein** fractions for WPC and WPI functionality.

L8 ANSWER 150 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Structure of particulate **whey protein** gels: effect of sodium chloride concentration, pH, heating temperature, and **protein** composition.

L8 ANSWER 151 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Winning wheys.

L8 ANSWER 152 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Aggregate formation during hydrolysis of beta-**lactoglobulin** with a Glu and Asp specific protease from Bacillus licheniformis.

L8 ANSWER 153 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Mechanical properties, water vapor permeability, and moisture contents of beta-**lactoglobulin** and **whey protein** films using multivariate analysis.

L8 ANSWER 154 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effects of lecithin addition in oil or water phase on the stability of emulsions made with **whey** proteins.

L8 ANSWER 155 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Out of the dairy case. (Dairy ingredients.)

L8 ANSWER 156 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Gel characteristics of beta-**lactoglobulin**, **whey protein** concentrate and **whey protein isolate**.

L8 ANSWER 157 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Production of **whey-protein**-enriched products.

L8 ANSWER 158 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Stabilization of **protein**-based emulsions by means of interacting polysaccharides.

L8 ANSWER 159 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Characteristics of the products of limited proteolysis of beta-**lactoglobulin**.

L8 ANSWER 160 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI The effects of calcium chloride on aggregation of **whey** proteins.

L8 ANSWER 161 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Enzymatic cross-linking of **whey** proteins by a calcium-independent microbial transglutaminase from Streptomyces lydicus.

L8 ANSWER 162 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Thermal stabilization of beta-**lactoglobulin** by **whey protein** fractions.

L8 ANSWER 163 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Oil-in-water emulsions stabilized by sodium caseinate or **whey protein isolate** as influenced by glycerol monostearate.

L8 ANSWER 164 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Comparison of oxygen and water vapor permeabilitites of **whey protein isolate** and beta-**lactoglobulin** edible films.

L8 ANSWER 165 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Reaction kinetics of pressure-induced denaturation of **whey** proteins.

L8 ANSWER 166 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effects of **protein** concentration and degree of hydrolysis during heating on the aggregation of beta-**lactoglobulin**.

L8 ANSWER 167 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Preparation and some properties of heat-treated **whey protein** hydrolysates.

L8 ANSWER 168 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effects of ionic strength on the solubility of **whey protein** products. A colloid chemical approach.

L8 ANSWER 169 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of preheating at high temperature under vacuum on physical properties of heat-induced **whey protein isolate** gels.

L8 ANSWER 170 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Beta-**lactoglobulin** separation from **whey protein isolate** on a large scale.

L8 ANSWER 171 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of pH on the stability and surface composition of emulsions made with **whey protein** isolates.

L8 ANSWER 172 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Oscillatory rheological comparison of the gelling characteristics of egg white, **whey protein** concentrates, **whey protein isolate**, and beta-**lactoglobulin**.

L8 ANSWER 173 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Heat-induced gel formation of beta-**lactoglobulin** : A study on secondary and tertiary structure as followed by circular dichroism spectroscopy.

L8 ANSWER 174 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of pH during heat processing of partially hydrolyzed **whey protein**.

L8 ANSWER 175 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI **Whey protein** concentrates and isolates: processing and functional properties.

L8 ANSWER 176 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI The effect of cations on rheological properties of **whey protein** gels.

L8 ANSWER 177 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Heat gelation of **whey** proteins.

L8 ANSWER 178 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Polymerisation of **whey** proteins in **whey protein**-solubilised emulsions.

L8 ANSWER 179 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Disulfide formation affects stability of **whey protein isolate** emulsions.

L8 ANSWER 180 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI The effect of alpha-**lactalbumin** and beta **lactoglobulin** on the texturization of rennet casein.

L8 ANSWER 181 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI A micro-scale method for measuring the hardness of heat-induced **protein** gels.

L8 ANSWER 182 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Heat-induced gelation of the mixtures of alpha-**lactalbumin** and beta-**lactoglobulin** in the presence of glutathione.

L8 ANSWER 183 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Gelling properties of **whey protein isolate**: influence of calcium removal by dialysis or diafiltration at acid or neutral pH.

L8 ANSWER 184 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Specific divalent cation-induced changes during gelation of beta-**lactoglobulin**.

L8 ANSWER 185 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Microcoagulation of a **whey protein isolate** by extrusion cooking at acid pH.

L8 ANSWER 186 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Changes in gelling behaviour of **whey protein isolate** and beta-**lactoglobulin** during storage: possible mechanism(s).

L8 ANSWER 187 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Spontaneous gelation of **whey** proteins in urea and guanidine hydrochloride.

L8 ANSWER 188 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Mechanism of urea-induced **whey protein** gelation.

L8 ANSWER 189 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Effect of heat and other factors on the structure and behaviour of selected proteins. Part VI. The molecular characteristics and digestibility of egg albumen and **whey protein isolate**.

L8 ANSWER 190 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Sulfhydryl group/disulfide bond interchange reactions during heat-induced gelation of **whey protein isolate**.

L8 ANSWER 191 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
TI Preaning stability of fluid emulsions containing different milk **protein** preparations.

=> d 1-191 all

L10 ANSWER 1 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1692 FSTA
TI Heat-induced aggregation of **milk protein**-stabilized emulsions: sensitivity to processing and composition.
AU Dickinson, E.; Parkinson, E. L.

CS Procter Dep. of Food Sci., Univ. of Leeds, Leeds LS2 9JT, UK. Fax +44-1132-332-982. E-mail e.dickinson(a)leeds.ac.uk
SO International Dairy Journal, (2004), 14 (7) 635-645, 30 ref.
ISSN: 0958-6946
DT Journal
LA English
AB Heat stability was studied in model systems of oil-in-water emulsions, pH 6.8, prepared with commercial **whey protein** **isolate** as emulsifying agent (2 or 3 weight%) and n-tetradecane as the oil phase (30 or 45 volume%). Samples were heated for up to 48 h at 70-90'b0C, and changes in viscosity and particle-size distribution were determined. Influence on heat-induced aggregation of **protein** /oil ratio, source of **whey protein**, use of β- **lactoglobulin** (β-LG) instead of **whey** **protein**, partial replacement of **whey protein** by sodium caseinate, pH and ionic strength was examined. Results showed that substitution of just 10% pure β-LG by caseinate in a heat-sensitive emulsion conferred stability for many hours at 90'b0C. A commercial **whey protein** that gave unflocculated emulsions at room temperature exhibited time-dependent heat-induced thickening behaviour after heating for a few minutes at >70'b0C. Under well-defined conditions, a maximum in apparent viscosity with heating time was observed, whose magnitude was sensitive to the extent and duration of shearing. Replacement of just 5% **whey protein** by caseinate in this emulsion completely eliminated this heat-induced viscosity maximum It is concluded that a very small proportion of casein may have a marked influence on the heat stability of a **whey protein** -based emulsion. A physicochemical mechanism is proposed to explain this behaviour, based on the additional steric stabilization conferred by a low density of dangling casein tails.
CC P (Milk and Dairy Products)
CT CASEINATES; EMULSIONS; LACTOGLOBULINS; PH; PHYSICAL PROPERTIES; THERMOPHYSICAL PROPERTIES; **WHEY**; **Nb -LACTOGLOBULIN**; HEAT STABILITY; IONIC STRENGTH; MODELLING; SODIUM CASEINATE; **WHEY PROTEINS**

L10 ANSWER 2 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 2000(11):P1794 FSTA
TI Renneting properties of transglutaminase-treated **milk**.
AU Lorenzen, P. C.
CS Fed. Dairy Res. Cent. Kiel, Inst. for Chem. & Physics, Hermann-Weigmann-Str. 1, 24103 Kiel, Germany
SO Milchwissenschaft, (2000), 55 (8) 433-437, 22 ref.
ISSN: 0026-3788
DT Journal
LA English
AB Renneting properties of transglutaminase (**protein**-glutamine γ-glutamyltransferase)-treated milk were studied. Renneting ability of milk decreased with increasing degree of crosslinking. Increased crosslinking was a result of increased heat impact and incubation time with transglutaminase, respectively. High heating of milk (92°C, 5 min) followed by enzyme treatment led to complete loss of renneting ability. Contents of sialic acid decreased linearly when high-heated milk was mixed with an increasing amount of high-heated and transglutaminase-treated (40°C, 120 min) milk. Model examinations using calcium caseinate and **whey protein** **isolate** as substrates were performed to analyse the mechanism of the decreased renneting ability. It is assumed that loss of renneting ability of transglutaminase-treated milk is induced by 'rface sealing' of casein micelles with cross-linked **whey** proteins, especially β- **lactoglobulin**. Additionally, the model investigations showed that rennet gels from transglutaminase-treated calcium caseinate dispersions have a different structure and consistency as well as

appearance from rennet gels from untreated caseinate.
CC P (Milk and Dairy Products)
CT COAGULATION; MILK; TRANSFERASES; **PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES**; RENNETABILITY

L10 ANSWER 3 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 1998(07):P1207 FSTA
TI Gel formation from industrial **milk whey** proteins under hydrostatic pressure: effect of hydrostatic pressure and **protein** concentration.
AU Kanno, C.; Tai-Hau Mu; Hagiwara, T.; Ametani, M.; Azuma, N.
CS Dep. of Applied Biochem., Utsunomiya Univ., Utsunomiya 321, Japan. Tel. & Fax +81-28-649-5461. E-mail kanno(a)cc.utsunomiya-u.ac.jp
SO Journal of Agricultural and Food Chemistry, (1998), 46 (2) 417-424, 34 ref.
ISSN: 0021-8561
DT Journal
LA English
AB The effects of high hydrostatic pressure and **protein** concentration on the denaturation and gelation of **whey protein** were investigated. Industrial **whey protein isolate** (WPI) and **whey protein concentrate** (WPC) solutions (pH 6.8) at various concentration were pressurized for 10 min at 30°C under 200-1000 MPa. With the WPI solution, the concentration for affecting the turbidity was 1% and was 6% for the viscosity at 400 MPa, while for inducing gelation, it was 10% at 600 MPa. With the WPC solution, the viscosity changed at a concentration >12%, and gel formation began at >18% at 400 MPa. The hardness and breaking stress of pressure-induced WPI gels increased with increasing concentration of WPI (12-18%) and hydrostatic pressure, the ratings for the 20% WPC gels being one-third those of the 20% WPI gels. The solubility of proteins from the pressure-induced WPI gels decreased with increasing pressure, while that of WPC gel induced at >600 MPa remained constant at approx. 50%. The microstructure of the WPI gels had a porous network form, whereas the WPC gels were irregular particulates. β- **Lactoglobulin**, α- **lactalbumin** and serum albumin preferentially participated in pressure-induced aggregation and gelation through S-S bonding.
CC P (Milk and Dairy Products)
CT GELATION; PRESSURE; **PROTEINS MILK**; **WHEY**; **WHEY PROTEINS**

L10 ANSWER 4 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 1997(02):G0049 FSTA
TI Characterization of polymers produced by cross-linking soybean 11S globulin with **milk whey** proteins using transglutaminase.
AU Yildirim, M.; Hettiarachchy, N. S.; Kalapathy, U.
CS United States of America, Institute of Food Technologists 1996 Annual Meeting; Dep. of Food Sci., Univ. of Arkansas, Fayetteville, AR 72704, USA
SO (1996), 1996 IFT annual meeting: book of abstracts, p. 120 ISSN 1082-1236
ISSN: 1082-1236
DT Conference
LA English
AB Synthesis and characterization of **protein** polymers formed by cross-linking of proteins with transglutaminase are described. The proteins used were purified soybean 11S globulin, crude **whey protein isolate** (WPI), and α- **lactalbumin** and β- **lactoglobulin** purified from WPI. Pairs of proteins were cross-linked at 37°C, pH 7.5 using 0.04 U of guinea pig transglutaminase/mg **protein**. Reaction mixtures were sampled at 30-240 min, and **protein** polymers were analysed by

electrophoresis, DSC and HPLC. 11S globulin formed polymers with WPI and the 2 individual **whey** proteins. The polymers were stable up to 80°C, had better thermal stability than WPI and exhibited similar stability to that of 11S globulin. [From En summ. Further abstracts of presentations from this meeting are covered in electronic formats of the FSTA database and may be traced via the corporate authors (CA) field, under United States of America, Institute of Food Technologists [1996 Annual Meeting]. See also FSTA (1996) 28 11A2.]
CC G (Catering, Speciality and Multicomponent Foods)
CT DAIRY PRODUCTS; ENZYMES; POLYMERS; PROTEINS; PROTEINS MILK; SOY PROTEINS; TRANSFERASES; **WHEY**; TRANSGLUTAMINASES; **WHEY PROTEINS**

L10 ANSWER 5 OF 9 FSTA COPYRIGHT 2004 IFIS on STN
AN 1988(10):G0031 FSTA
TI Creaming stability of fluid emulsions containing different **milk protein** preparations.
AU Leman, J.; Haque, Z.; Kinsella, J. E.
CS Inst. of Food Sci., Cornell Univ., Ithaca, NY 14853, USA
SO Milchwissenschaft, (1988), 43 (5) 286-289, 26 ref.
ISSN: 0026-3788
DT Journal
LA English
SL German
AB Effects of pH, ionic strength, **protein** concentration, energy input and heat treatment on creaming stability of emulsions made with whole milk proteins (MP), β- **lactoglobulin** (β-Lg), **whey protein isolate** (WPI) and micellar casein (MC) were studied at an oil:water ratio of 4:6. Increasing the energy input using a single-piston recirculating homogenizer improved emulsion stability. More stable emulsions were obtained as **protein** concentration were increased from 1 to 3% and, in the pH range 6-9, stability was lowest at pH 6. Under the conditions used β-Lg formed emulsions with best creaming stability, the order being β-Lg > WPI > MP > MC. Emulsions were stable following heating at 70 or 80°C for 5-20 min.
CC G (Catering, Speciality and Multicomponent Foods)
CT CREAM; DAIRY PRODUCTS; EMULSIONS; MILK; PROTEINS; PROTEINS MILK; STABILITY; CREAMING; MILK EMULSIONS; MILK PROTEINS

L10 ANSWER 6 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN
AN 643020 FROSTI
TI What's so good about **milk**?
AU Deeprose J.
SO International Food Ingredients, 2004, (June-July), (3), 36+38 (0 ref.)
Published by: http://www.ifi-online.com
ISSN: 0924-5863
DT Journal
LA English
AB Applications of **milk** derivatives and ingredients in the food processing industry are discussed. **Whey protein** concentrates with a **protein** content of more than 80% can give good gelling and water-binding in the preparation of meat products. Hiprotal 580HG is a new **whey protein concentrate** containing high levels of beta-**lactoglobulin** that can be used to improve the texture, taste and nutritional value of food products. Domvictus, a **concentrate** range with lower **protein** levels, includes 835MP modified to enhance the fat impression in low-fat yoghurts and 535 described as a functional ingredient for gelling. Casein and caseinates are used for emulsifying and stabilising nutritional drinks. Caseino glycomacropeptide (CGMP), a bioactive peptide made from sweet **whey**, appears to have potential as a prebiotic in functional food. Functional properties and applications of **milk protein** isolates and **whey protein** concentrates are described. Research into

the health benefits of **whey** proteins have resulted in a new generation of functional foods, focusing on the bioactive properties of ingredients. Casein and **whey** proteins can be degraded, fermented, isolated and concentrated, giving functional peptides that behave differently. EMSER is a high **protein milk** derivative used as an emulsifier/stabiliser in meat products. The **milk protein** fraction Try-Pro is claimed to enhance serotonin secretion.

SH PROTEINS

CT APPLICATIONS; BIOACTIVE PEPTIDES; CASEIN; CASEINATES; DAIRY PRODUCTS; FUNCTIONAL FOODS; FUNCTIONAL INGREDIENTS; FUNCTIONAL PROPERTIES; INGREDIENTS; **MILK PROTEIN**; **MILK** PROTEINS; PEPTIDES; **PROTEIN**; PROTEINS; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**

DED 16 Jul 2004

L10 ANSWER 7 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN

AN 537831 FROSTI

TI **Milk** proteins.

AU Ennis M.P.; Mulvihill D.M.

SO Handbook of hydrocolloids., Published by: Woodhead Publishing Ltd, Cambridge, 2000, 189-217 (42 ref.)
Phillips G.O.; Williams P.A.
ISBN: 1-85573-501-6

DT Book Article

LA English

AB **Milk** proteins are useful food additives because of their high nutritional value and functional properties. An overview of **milk** proteins is provided. Consideration is given to the composition of **milk** and the distribution of proteins in **milk**; the manufacture of **milk protein** products (e.g. caseins, caseinates, the fractionation of caseins, **whey** powders and modified **whey** powders, **whey protein concentrate**, **whey protein isolate**, **lactalbumin** and the fractionation of **whey** proteins); functional properties (solubility, gelation, coagulation, hydration, viscosity, and surface active, emulsifying and foaming properties) of **milk protein** products; applications (in bakery products, dairy products, beverages, desserts, pasta products, confectionery, meat products, convenience foods, textured products, films and coatings); and future developments. Tables and figures supplement the text.

SH ADDITIVES

CT APPLICATIONS; CASEIN; CASEINATES; COMPOSITION; DAIRY PRODUCTS; FUNCTIONAL PROPERTIES; HYDROCOLLOIDS; **MILK PROTEIN**; **MILK PROTEIN** PRODUCTS; **MILK** PROTEINS; PRODUCTION; **PROTEIN**; **PROTEIN** PRODUCTS; PROTEINS; REVIEW; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; VISCOSITY; **WHEY** PRODUCTS

DED 23 Nov 2000

L10 ANSWER 8 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN

AN 505592 FROSTI

TI Fractionation of **milk** proteins.

AU Maubois J.-L.

SO Proceedings of the 25th International Dairy Congress, Aarhus, September 1998. Volume 2: dairy science and technology., Published by: Danish National Committee of the IDF, Aarhus, 1999, 74-86 (35 ref.)
Danish National Committee of the IDF
ISBN: 87-89795-82-2

DT Conference Article

LA English

AB There is increasing interest in the use of separated milk proteins in functional foods and nutraceutical products. The dairy industry has developed advanced procedures for the separation of milk proteins. In this chapter, the basic principles of the separation of milk proteins are explained, and recent advances in the separation and purification of proteins from fluid milk are reviewed. Methods of controlling microbial growth during **protein** separations are mentioned and include chilling, membrane microfiltration, and more recently, two microfilters in cascade, dynamic membrane filtration, and improved ceramic membranes. The chapter then reviews developments in the preparation of micellar casein and **whey protein** isolates (an integrated **protein** extraction process), beta-**lactoglobulin**, and kappa-glycomacropeptide (and antithrombic peptides). Figure are presented that illustrate the steps involved in milk-**protein** separation, the preparation of beta-**lactoglobulin**, and the manufacture of glycomacropeptide.
SH DAIRY PRODUCTS
CT BETA **LACTOGLOBULIN**; CASEIN; DAIRY PRODUCTS; EXTRACTION; KAPPA GLYCOMACROPEPTIDE; **LACTOGLOBULIN**; MEMBRANES; MILK; MILK PROTEINS; PRODUCTION; PROTEINS; PURIFICATION; SEPARATION; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**
DED 21 Oct 1999

L10 ANSWER 9 OF 9 FROSTI COPYRIGHT 2004 LFRA on STN
AN 191192 FROSTI
TI Preaning stability of fluid emulsions containing different **milk protein** preparations.
AU Leman J.; Haque Z.; Kinsella J.E.
SO Milchwissenschaft, 1988, 43 (5), 286-9 (26 ref.)
DT Journal
LA English
SL English; German
AB Emulsions were prepared from skimmed milk proteins, beta-**lactoglobulin**, **whey protein isolate** and micellar casein at an oil/water ratio of 4:6 using a single piston valve homogeniser. The effects of pH, ionic strength, **protein** concentration, energy input and heat treatment on the relative stability of the emulsions was investigated. Emulsion stability depended upon the amount and type of **protein** adsorbed onto the dispersed phase globule surface. This was affected by the concentration of **protein** in dispersion, pH and emulsifying time.
CT CONCENTRATION; CREAMING; EMULSIFICATION; EMULSIFYING CAPACITY; EMULSIFYING PROPERTIES; EMULSIONS; EVALUATION; FACTORS AFFECTING; HEAT STABILITY; HEATING; HOMOGENIZATION; IONS; MILK **PROTEIN**; MILK PROTEINS; OIL EMULSIONS; PH; POWER; PROPERTIES; PROTEINS; STABILITY; TYPE; WATER EMULSIONS
DED 25 Oct 1988

=> d his

(FILE 'HOME' ENTERED AT 08:06:40 ON 16 SEP 2004)

FILE 'FSTA, FROSTI' ENTERED AT 08:06:49 ON 16 SEP 2004
L1 4825 S LACTALBUMIN OR LACTOGLOBULIN OR SIALYLLACTOSE
L2 3772 S (MILK AND PROTEIN AND CONCENTRATE) OR (WHEY AND PROTEIN AND I
L3 374 S L1 AND L2
L4 0 S (MILK ADJ1 PROTEIN ADJ1 CONCENTRATE) OR (WHEY ADJ1 PROTEIN AD
L5 265 S MILK PROTEIN CONCENTRATE
L6 997 S WHEY PROTEIN ISOLATE
L7 13 S L3 AND L5
L8 191 S L3 AND L6
L9 52950 S MILK/TI

L10 9 S L8 AND L9

=> d l8 1-191 all

L8 ANSWER 1 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P2002 FSTA
TI Fractionation of proteins from **whey** using cation exchange chromatography.
AU Doultani, S.; Turhan, K. N.; Etzel, M. R.
CS Correspondence (Reprint) address, M. R. Etzel, Dep. of Food Sci., Univ. of Wisconsin, Madison, WI 53706, USA. Tel. +1 608 263 2083. Fax +1 608 262 6872. E-mail etzel(a)engr.wisc.edu
SO Process Biochemistry, (2004), 39 (11) 1737-1743, 18 ref.
ISSN: 0032-9592
DT Journal
LA English
AB Development of an ion-exchange chromatography fractionation method for isolation of **whey** proteins was undertaken with the aims of using inexpensive, food-grade buffers and adsorbent, to achieve a high flow-rate and to avoid using salt for elution. SP Sepharose Big Beads (Amersham Biosciences, USA) were used in the cation exchange column and simultaneously bound all the positively charged proteins in Mozzarella cheese **whey**. The column was then rinsed with deionized water to remove contaminants and then eluted selectively to separate the different **whey** proteins. 3 elution procedures were used, depending on the desired **protein** products: a single elution buffer for **whey protein isolate** (WPI); 2 elution buffers for α- **lactalbumin** (α-LA) and WPI depleted in α-LA; or 4 elution buffers to **isolate** α-LA, WPI depleted in α-LA, lactoperoxidase and lactoferrin. Other elution procedures could be applied, depending on the required products. The **protein** isolates were produced with high yields and purities. It is suggested that this process offers significant improvements over current commercial practices for the fractionation of **whey** proteins.
CC P (Milk and Dairy Products)
CT CHROMATOGRAPHY; FRACTIONATION; **WHEY**; ION EXCHANGE CHROMATOGRAPHY; **WHEY PROTEINS**

L8 ANSWER 2 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1929 FSTA
TI A two-stage ultrafiltration process for fractionation of **whey protein isolate**.
AU Beelin Cheang; Zydney, A. L.
CS Correspondence (Reprint) address, A. L. Zydney, Dep. of Chem. Eng., Pennsylvania State Univ., University Park, PA 16802, USA. Tel. +1-814-863-7113. Fax +1-814-865-7846. E-mail zydney(a)engr.psu.edu
SO Journal of Membrane Science, (2004), 231 (1-2) 159-167, 13 ref.
ISSN: 0376-7388
DT Journal
LA English
AB Separation of α- **lactalbumin** and β- **lactoglobulin** from **whey protein isolate** using membrane ultrafiltration was studied. A 2-stage tangential flow filtration system was employed with 100 and 30 kDa membranes in series. Using the membranes in either order gave >10x α- **lactalbumin** purification at 90% yield. In contrast, recovery of β- **lactoglobulin** was less straightforward as it was present in the permeate from one stage and the retentate from the other.
CC P (Milk and Dairy Products)
CT LACTALBUMINS; LACTOGLOBULINS; MEMBRANES; SEPARATION; ULTRAFILTRATION; **WHEY**; **Na -LACTALBUMIN**; **Nb -LACTOGLOBULIN**;

WHEY PROTEINS

L8 ANSWER 3 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1859 FSTA
TI Sustained improver of muscular fatigue.
IN Tsuchita, H.; Saito, M.; Kamiya, T.; Komatsu, M.
PA Meiji Dairies Corp.; Kyowa Hakko Kogyo Co. Ltd.; Meiji Dairies, Koto-ku, Tokyo 136-8908, Japan
SO PCT International Patent Application, (2004)
PI WO 2004049830 A1
PRAI JP 2002-350200 20021202
DT Patent
LA English
AB A long-acting improver of muscle fatigue comprising 4 amino acids (Leu, Ile, Val and Glu) and a **whey protein** component (**whey protein** and/or decomposition product of **whey protein**) is described. ≥1 of the following is used as the **whey protein**: a **whey protein isolate**; a **whey protein** concentrate; β- **lactoglobulin**; and α- **lactalbumin**. Novel foods or drinks and pharmaceuticals which exhibit sustained recovery effects on muscular fatigue are also provided.
CC P (Milk and Dairy Products)
CT AMINO ACIDS; BEVERAGES; HUMAN PHYSIOLOGY; NOVEL FOODS; PATENTS; **WHEY**; PHYSIOLOGICAL EFFECTS; **WHEY PROTEINS**

L8 ANSWER 4 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1799 FSTA
TI Heat-induced changes in the ultrasonic properties of **whey** proteins.
AU Corredig, M.; Verespej, E.; Dalgleish, D. G.
CS Dep. of Food Sci., Univ. of Guelph, Guelph, Ont. N1G 2W1, Canada. Tel. 519-824-4120, ext. 56101. Fax 519-824-6631. E-mail mcorredi(a)uoguelph.ca
SO Journal of Agricultural and Food Chemistry, (2004), 52 (14) 4465-4471, 25 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Physical aggregation of commercial **whey protein isolate** (WPI) and purified β- **lactoglobulin** was investigated by ultrasound spectroscopy. **Protein** samples were dialysed to achieve constant ionic strength backgrounds of 0.01 and 0.1 NaCl, and gelation was induced in situ at constant temperature (50-75°C) or with a temperature ramp from 20 to 85°C. Changes in the ultrasonic properties were shown in the early stages of heating, at temperature below those reported for **protein** denaturation. During heating, the relative ultrasound velocity (defined as the difference between sample velocity and reference velocity) decreased continuously with temperature, indicating a rearrangement of the hydration layer of the **protein** and an increase in compressibility of the **protein** shell. At temperature <50°C ultrasonic attenuation decreased, and at temperature <65°C both velocity and attenuation differentials showed increasing values. A sharp decrease in the relative velocity and an increase in the attenuation at 70°C were indications of classical **protein** denaturation and the formation of a gel network. Values of attenuation were significantly different between samples prepared with 0.01 and 0.1M NaCl, although no difference was shown in the overall ultrasonic behaviour. WPI and β- **lactoglobulin** showed similar ultrasonic properties during heating, but some differences were noted in the values of attenuation of WPI solutions, which may relate to a less homogeneous distribution of aggregates caused by the presence of α-

lactalbumin and other minor proteins in WPI.
CC P (Milk and Dairy Products)
CT AGGLOMERATION; HEATING; LACTOGLOBULINS; TEMPERATURE; ULTRASOUND; **WHEY**; **Nb -LACTOGLOBULIN**; AGGREGATION; TEMP.; ULTRASONICS; **WHEY PROTEINS**

L8 ANSWER 5 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1692 FSTA
TI Heat-induced aggregation of milk **protein**-stabilized emulsions: sensitivity to processing and composition.
AU Dickinson, E.; Parkinson, E. L.
CS Procter Dep. of Food Sci., Univ. of Leeds, Leeds LS2 9JT, UK. Fax +44-1132-332-982. E-mail e.dickinson(a)leeds.ac.uk
SO International Dairy Journal, (2004), 14 (7) 635-645, 30 ref. ISSN: 0958-6946
DT Journal
LA English
AB Heat stability was studied in model systems of oil-in-water emulsions, pH 6.8, prepared with commercial **whey protein** **isolate** as emulsifying agent (2 or 3 weight%) and n-tetradecane as the oil phase (30 or 45 volume%). Samples were heated for up to 48 h at 70-90'b0C, and changes in viscosity and particle-size distribution were determined. Influence on heat-induced aggregation of **protein** /oil ratio, source of **whey protein**, use of β- **lactoglobulin** (β-LG) instead of **whey** **protein**, partial replacement of **whey protein** by sodium caseinate, pH and ionic strength was examined. Results showed that substitution of just 10% pure β-LG by caseinate in a heat-sensitive emulsion conferred stability for many hours at 90'b0C. A commercial **whey protein** that gave unflocculated emulsions at room temperature exhibited time-dependent heat-induced thickening behaviour after heating for a few minutes at >70'b0C. Under well-defined conditions, a maximum in apparent viscosity with heating time was observed, whose magnitude was sensitive to the extent and duration of shearing. Replacement of just 5% **whey protein** by caseinate in this emulsion completely eliminated this heat-induced viscosity maximum It is concluded that a very small proportion of casein may have a marked influence on the heat stability of a **whey protein** -based emulsion. A physicochemical mechanism is proposed to explain this behaviour, based on the additional steric stabilization conferred by a low density of dangling casein tails.
CC P (Milk and Dairy Products)
CT CASEINATES; EMULSIONS; LACTOGLOBULINS; PH; PHYSICAL PROPERTIES; THERMOPHYSICAL PROPERTIES; **WHEY**; **Nb -LACTOGLOBULIN**; HEAT STABILITY; IONIC STRENGTH; MODELLING; SODIUM CASEINATE; **WHEY PROTEINS**

L8 ANSWER 6 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1467 FSTA
TI Separation and characterization of β- **lactoglobulin** and α- **lactalbumin** from **whey** and **whey** **protein** preparations.
AU Alomirah, H. F.; Alli, I.
CS Correspondence (Reprint) address, I. Alli, Dep. of Food Sci. & Agric. Chem., McGill Univ., St. Anne de Bellevue, Que. H9X 3V9, Canada. Fax +1 514 398 7977. E-mail alli(a)macdonald.mcgill.ca
SO International Dairy Journal, (2004), 14 (5) 411-419, 35 ref. ISSN: 0958-6946
DT Journal
LA English
AB Isolation of β- **lactoglobulin** (β-Lg) and α- **lactalbumin** (α-La) from commercial liquid **whey**, **whey protein isolate** (WPI) or **whey**

protein concentrate (WPC), using a combination of previously described methods, and characterization of the resultant **protein** fractions are reported. Isolation utilized the solubility of β-Lg at low pH in the presence of salt, the weak Ca-binding capacity of α-La at pH values of <3.9 and the ease of chelating Ca, thus causing precipitation of the Ca-free form of α-La. Of the 4 chelating agents tested, sodium citrate and sodium hexametaphosphate were more effective for separation of β-Lg and α-La from the **whey protein** sources than EDTA or EGTA. Recoveries from the **whey** preparations of 47-69% β-Lg were achieved, with purities in the range 84-95% and **protein** contents of 40-99%, depending on the source of **whey protein** and type of chelating agent. Yields of α-La obtained without pH adjustment were 23-89%, with purities ranging from 83 to 90%, and **protein** contents of 65-96%; yields of α-La obtained with adjustment to pH 7.5 were 11-43%, with purities 68-73%, and **protein** contents of 44-81%. Ash contents of some **protein** fractions were relatively high; it is suggested that this would limit their use in food applications. Glycation was detected; the highest degree of glycation was in the proteins from WPC, thus, β-Lg and α-La isolated from WPC were estimated to have a higher mol. weight than those isolated from liquid **whey** or WPI.

CC P (Milk and Dairy Products)

CT FRACTIONATION; LACTALBUMINS; LACTOGLOBULINS; **PROTEIN CONCENTRATES**; PROTEINS; **WHEY**; **Na -LACTALBUMIN**; **Nb -LACTOGLOBULIN**; **PROTEIN ISOLATES**; **WHEY PROTEIN CONCENTRATES**

L8 ANSWER 7 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2004:P1150 FSTA

TI Influence of stabilizing bonds on the texture properties of high-pressure-induced **whey protein** gels.

AU Keim, S.; Hinrichs, J.

CS Dep. for Animal Foodstuff Tech., Inst. for Food Tech., Univ. of Hohenheim, D-70599 Stuttgart, Germany. Fax +49-711-459-3617. E-mail keim-lth(a)uni-hohenheim.de

SO International Dairy Journal, (2004), 14 (4, 3rd NIZO Dairy Conference on Dynamics of Texture, Process and Perception) 355-363, 37 ref. ISSN: 0958-6946

DT Journal

LA English

AB High-pressure-induced gel formation of **whey protein isolate** (WPI, 15% **protein**) was studied at an operating pressure of 600 MPa, a temperature of 30°C and pressure holding times of 0-30 min. Stable gels were formed with each pressure treatment. Beyond the stabilizing molecular interactions, disulfide bonds dominated in the formed gels, detected by means of an extraction test applying different buffer systems. Content of the native **whey protein** fractions α- **lactalbumin** and β- **lactoglobulin** A and B decreased and the amount of intermolecular disulfide bonds increased with prolonged pressure holding time. Gels became stronger and more elastic with increasing holding time. It is concluded that the amount of stabilizing disulfide bonds directly influences texture of high-pressure-induced **whey protein** gels.

CC P (Milk and Dairy Products)

CT GELATION; GELS; PRESSURE; PROCESSING; PROTEINS; TEXTURE; **WHEY**; HIGH PRESSURE PROCESSING; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 8 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2004:P1070 FSTA

TI Immunomodulating effects of **whey** proteins and their enzymatic digests.

AU Mercier, A.; Gauthier, S. F.; Fliss, I.
CS Correspondence (Reprint) address, S. F. Gauthier, Dep. des Sci. des Aliments et de Nutr., Cent. de Recherche en Sci. et Tech. du Lait., Univ. Laval, Sainte-Foy, Que. G1K 7P4, Canada. Tel. +1-418-656-2682. Fax +1-418-656-3353. E-mail sylvie.gauthier(a)aln.ulaval.ca
SO International Dairy Journal, (2004), 14 (3) 175-183, 39 ref.
ISSN: 0958-6946
DT Journal
LA English
AB Immunomodulatory properties of commercial **whey protein** products and **protein** hydrolysates produced from them via the action of trypsin/chymotrypsin were evaluated; their effects on in vitro proliferation of lymphocytes isolated from murine spleen were measured. Results showed that microfiltered **whey protein** **isolate** (MF-WPI) at 100 μg/ml significantly increased lymphocytes proliferation. An inhibitory effect was measured with lactoferrin at the same concentration, while no effect was observed with WPI prepared using ion exchange chromatography, β- **lactoglobulin** , α- **lactalbumin** and glycomacropeptide. Enzymic digestion of the **whey protein** products abolished the inhibitory effect of lactoferrin and reduced the stimulating effect of MF-WPI. However, fractionation by IEF of the MF-WPI digests produced peptide fractions that stimulated cell proliferation at much lower concentration compared with the total hydrolysates (0.5-500 vs. 2000 μg/ml). Results suggest that **whey** proteins contain some immunomodulatory peptides which can be released by enzymic digestion, and that identification and isolation of these bioactive peptides would promote development of potent immunomodulatory products.
CC P (Milk and Dairy Products)
CT IMMUNOLOGY; PEPTIDES; PROTEINS; **WHEY**; BIOACTIVE PEPTIDES; IMMUNOMODULATION; **PROTEIN HYDROLYSATES**; **PROTEIN ISOLATES** ; **WHEY PROTEINS**

L8 ANSWER 9 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P1059 FSTA
TI Fractionation of **whey** proteins by bipolar membrane electroacidification.
AU Bazinet, L.; Ippersiel, D.; Behzad Mahdavi
CS Inst. of Nutraceuticals & Functional Foods (INAF), Cent. de Recherche en Sci. & Tech. du Lait (STELA), Univ. Laval, Sainte-Foy, Que. G1K 7P4, Canada. Tel. +1-418-656-2131. Fax +1-418-656-3353. E-mail laurent.bazinet(a)aln.ulaval.ca
SO Innovative Food Science and Emerging Technologies, (2004), 5 (1) 17-25, 30 ref.
ISSN: 1466-8564
DT Journal
LA English
AB Bipolar membrane electroacidification (BMEA) was investigated as a means of fractionating **whey** proteins. In addition, effects of **protein** concentration (5, 10 or 20%) upon the purity and yield of the separated fraction were evaluated. The feasibility of BMEA for this procedure was evaluated on the basis of electrodialytic parameters, precipitation kinetics, **protein** profiles, **isolate** composition and **isolate** purity. BMEA separated 98% pure β- **lactoglobulin** (β-Lg) from 5% **whey protein** **isolate** (WPI) with a recovery yield of 44%. A β-Lg enriched fraction was obtained from 10% WPI, containing 97.3% β-Lg and 2.7% α- **lactalbumin** (α-La) and having 98% total **protein** purity. Total **protein** purity was also 98% for the fraction separated from 20% WPI, which contained 94.9% β-Lg and 4.8% α-La. Results suggest that BMEA is suitable for separating **whey protein** fractions with high purity from WPI.

CC P (Milk and Dairy Products)
CT ACIDIFICATION; FRACTIONATION; LACTALBUMINS; LACTOGLOBULINS; PROTEINS; PURITY; **WHEY**; **Na -LACTALBUMIN**; **Nb -LACTOGLOBULIN**; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 10 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0956 FSTA
TI Effect of processing on the displacement of **whey** proteins: applying the orogenic model to a real system.
AU Woodward, N. C.; Wilde, P. J.; Mackie, A. R.; Gunning, A. P.; Gunning, P. A.; Morris, V. J.
CS Correspondence (Reprint) address, P. J. Wilde, Inst. of Food Res., Norwich Res. Park, Norwich, NR4 7UA, UK. Tel. +44 1603 255258. Fax +44 1603 507723. E-mail Peter.Wilde(a)bbsrc.ac.uk
SO Journal of Agricultural and Food Chemistry, (2004), 52 (5) 1287-1292, 15 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Atomic force microscopy (AFM) has been used to investigate the displacement of a commercial **whey protein** system and the behaviour as compared to that of β- **lactoglobulin** (β-Lg) [Mackie et al., Journal of Colloid Interface Science (1999) 210, 157-166]. **Whey protein isolate** (WPI) was orogenically displaced from an air-water interface by the surfactants Tween 20 and Tween 60. Displacement data obtained were compared with data obtained for pure β-Lg, and showed that WPI was more resistant to displacement from the air-water interface than native β-Lg. This was related to the greater surface elasticity of WPI at higher surface stresses. In the presence of Tween 20, WPI was observed to remain on the interface at surface pressures of up to 8 mN/m greater than the surface pressure at which complete displacement of β-Lg was observed. Displacement of WPI and β-Lg films by Tween 60 showed similar results. However, because of the lower surface activity of Tween 60, it was not possible to reach surface tension values similar to those obtained for Tween 20. Despite the lower surface activity of Tween 60, WPI was still observed to be present at the interface at surface pressure values greater than those by which β-Lg had been completely displaced.
CC P (Milk and Dairy Products)
CT LACTOGLOBULINS; PHYSICAL PROPERTIES; PROTEINS; SURFACTANTS; **WHEY**; **Nb -LACTOGLOBULIN**; PHYSICOCHEMICAL PROPERTIES; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 11 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0937 FSTA
TI **Whey protein isolate** and α-**lactalbumin** recovery from lactic acid **whey** using cation-exchange chromatography.
AU Turhan, K. N.; Etzel, M. R.
CS Correspondence (Reprint) address, M. R. Etzel, Dep. of Food Sci., Univ. of Wisconsin, Madison, WI 53706, USA. E-mail etzel(a)engr.wisc.edu
SO Journal of Food Science, (2004), 69 (2) FEP66-FEP70, 34 ref.
ISSN: 0022-1147
DT Journal
LA English
AB A process was developed for fractionation of proteins from lactic acid **whey** using food-grade buffers and cation-exchange chromatography. Bound proteins were desorbed either all at once to make **whey protein isolate** (WPI) or in 2 steps to 1st make α-**lactalbumin** (ALA) and then WPI depleted in ALA. Recovery and purity using lactic acid **whey** were comparable to those previously reported for processes using sweet **whey**. However, capacity and throughput were slightly lower using lactic acid **whey**

. It is suggested that this research provides a basis for adding value to the 6 million metric tons of lactic acid **whey** produced annually in the USA.
CC P (Milk and Dairy Products)
CT FRACTIONATION; PROTEINS; **WHEY**; **ACID WHEY**; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 12 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0782 FSTA
TI Use of multi-angle laser light scattering and size-exclusion chromatography to characterize the molecular weight and types of aggregates present in commercial **whey protein** products.
AU Wang, T.; Lucey, J. A.
CS Correspondence (Reprint) address, J. A. Lucey, Dep. of Food Sci., Univ. of Wisconsin-Madison, Madison, WI 53706, USA. E-mail jalucey(a)facstaff.wisc.edu
SO Journal of Dairy Science, (2003), 86 (10) 3090-3101, 32 ref.
ISSN: 0022-0302
DT Journal
LA English
AB Commercial **whey protein isolate** (WPI) and **whey protein** concentrate (WPC) samples were characterized, in terms of their mol. weight and **whey protein** composition, by size exclusion chromatography coupled with a multi-angle laser light scattering (MALLS) detector. Furthermore, an improved TCA precipitation method was used to quantify glycomacropeptide (GMP) in WPI and WPC. The MALLS system detected some very large-sized material that eluted close to void volume in all samples; this material was barely detected by a concentration detector. It was demonstrated, by chitosan treatment, that this peak consisted of very small lipid globules or phospholipids, which gave a residual cloudy appearance in upper layers after ultracentrifugation of **whey** product. Composition, mol. weight and the photodiode array (PDA) spectrum (200-400 nm) of the major **protein** peaks, including β- **lactoglobulin** (BLG), α- **lactalbumin** (ALA), bovine serum albumin (BSA), immunoglobulin G (IgG) and some minor components were analysed. The mol. weight of BLG, ALA, BSA and IgG peaks in WPI were 2.3-3.7 x 10.sup.4, 1.4-1.6 x 10.sup.4, 4.8-6.7 x 10.sup.4 and 1.2-2.5 x 10.sup.5 Da, respectively. Compared with WPI, WPC had similar major proteins, but more large-sized residual lipid material and different minor constituents, such as lactose and non-**protein** N, depending on various commercial samples and **protein** content. The improved TCA precipitation method demonstrated that there was a very low concentration of GMP in WPI manufactured using an ion-exchange process. The mol. weight of GMP was found to be approx. 8600 Da. Size exclusion chromatography MALLS was found to be a powerful technique for detailed analysis of the mol. weight of various proteins, aggregates and minor components, such as GMP, in **whey protein** products.
CC P (Milk and Dairy Products)
CT CHROMATOGRAPHY; PEPTIDES; PHYSICAL PROPERTIES; **PROTEIN CONCENTRATES**; PROTEINS; **WHEY**; GLYCOMACROPEPTIDES; MOL. WT.; **PROTEIN ISOLATES**; **WHEY PROTEIN CONCENTRATES**; **WHEY PROTEINS**

L8 ANSWER 13 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0777 FSTA
TI Influence of κ-carrageenan on the aggregation behaviour of proteins in heated **whey protein isolate** solutions.
AU Fuente, M. A. de la; Hemar, Y.; Singh, H.
CS Correspondence (Reprint) address, H. Singh, Riddet Cent., Massey Univ., Palmerston North, New Zealand. Tel. +64 6 350 4401. Fax +64 6 350 5655. E-mail h.singh(a)massey.ac.nz

SO Food Chemistry, (2004), 86 (1) 1-9, 21 ref.
ISSN: 0308-8146
DT Journal
LA English
AB Effects of κ-carrageenan (KCG) on the heat-induced aggregation of **whey protein isolate** (WPI) were investigated. KCG (0.05, 0.1 or 0.15%) was added to 2% WPI solutions (pH 7.0), which were then heated at 75°C for up to 15 min. Characteristics of aggregates formed during heating were studied using size-exclusion chromatography, coupled with multi-angle laser light scattering and gel electrophoresis. During the early stages of heating, the mol. weight of WPI aggregates was lower in the presence than in the absence of KCG; however, after longer periods of heating, mol. weight of aggregates were not affected by the presence of KCG. Addition of KCG had no effect on losses of native α- **lactalbumin** or β- **lactoglobulin**.
CC P (Milk and Dairy Products)
CT AGGLOMERATION; CARRAGEENANS; HEATING; **WHEY**; AGGREGATION; **WHEY PROTEINS**

L8 ANSWER 14 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0628 FSTA
TI Effect of pre-heating on the foaming properties of **whey protein isolate** using a membrane foaming apparatus.
AU Bals, A.; Kulozik, U.
CS Correspondence (Reprint) address, U. Kulozik, Inst. for Food Process Eng., Weihenstephaner Berg 1, 85350 Freising, Germany. Tel. +49-8161-714205. E-mail ulrich.kulozik(a)wzw.tum.de
SO International Dairy Journal, (2003), 13 (11) 903-908, 17 ref.
ISSN: 0958-6946
DT Journal
LA English
AB Effect of the thermal denaturation of **whey** proteins on the formation, stability and structure of their respective foams was examined. **Whey protein** solution with a **protein** concentration of 10% was heated to 60-90°C before cooling to 40°C. Surfactant properties of the **whey** proteins were characterized by measuring surface tension, and a membrane foaming apparatus was used to gently produce the foams. Foam properties and bubble size were then measured. Results demonstrated that denaturation of β- **lactoglobulin**, the main component in **whey protein isolate**, strongly improved foam stability, and at a denaturation degree >70%, drainage can be reduced to a large extent. Higher levels of **protein** denaturation, and thus higher viscosities of the **protein** solution, were found to produce coarser foam textures with larger bubbles. Furthermore, incorporation of bubbles was more difficult when viscosity of the continuous phase was high.
CC P (Milk and Dairy Products)
CT DENATURATION; FUNCTIONAL PROPERTIES; HEATING; **WHEY**; FOAMING PROPERTIES; **WHEY PROTEINS**

L8 ANSWER 15 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0423 FSTA
TI Mineral modulation of thermal aggregation and gelation of **whey** proteins: from β- **lactoglobulin** model system to **whey protein isolate**.
AU Caussin, F.; Famelart, M. H.; Maubois, J. L.; Bouhallab, S.
CS Correspondence (Reprint) address, S. Bouhallab, Lab. de Recherches de Tech. Laitiere, INRA, 65 Rue de Saint-Brieuc, 35042 Rennes Cedex, France. E-mail sbouhal(a)rennes.inra.fr
SO Lait, (2003), 83 (5) 353-364, 28 ref.
ISSN: 0023-7302
DT Journal

LA English
SL French
AB Mineral modulation of thermal aggregation and gelation of **whey** proteins was investigated. The characteristics of aggregates and gels formed by β- **lactoglobulin** (β-Lg) as a single component or in more complex systems were compared. Solutions of 100 g/kg of β-Lg, β-Lg + α- **lactalbumin** (α-La), β-Lg + α-La + bovine serum albumin or **whey protein isolate** were heated at 75°C, pH 6.8 in water and in the presence of either 100 mmol/l NaCl or 10 mmol/l CaCl.sub.2. The subsequent polymerization-aggregation processes in solution before gelation and the physical properties of the formed gels were determined. The disappearance of native-like proteins, formation of β-Lg covalent dimer and the nature of the interactions involved in the formed aggregates were addressed. Whatever the **protein** system, both NaCl and CaCl.sub.2 increased gel strength and decreased gelation time. At gelling time, relatively small aggregates, formed by the contribution of the total initial amount of proteins, were observed in samples without added salts. In contrast, with NaCl or CaCl.sub.2, only part of the initial amount of proteins was aggregated before gel time. Very large aggregates were formed in the presence of Ca. Under these 2 mineral conditions, as well as in samples without added salt, covalent disulphide bonds were observed to be the major forces involved in the aggregation process at gel time.
CC P (Milk and Dairy Products)
CT ADDITIVES; AGGLOMERATION; CALCIUM; CHLORIDES; GELATION; LACTOGLOBULINS; SALT; **WHEY**; **Nb -LACTOGLOBULIN**; AGGREGATION; CACL2; NACL; **WHEY PROTEINS**

L8 ANSWER 16 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:P0026 FSTA
TI Influence of sugar moiety (rhamnosylglucoside) at 3-O position on the reactivity of quercetin with **whey** proteins.
AU Harshadrai M. Rawel; Rohn, S.; Kroll, J.
CS Correspondence (Reprint) address, J. Kroll, Inst. of Nutr. Sci., Univ. of Potsdam, D-14558 Bergholz-Rehbruecke, Potsdam, Germany. Tel. +49-33200-88262. Fax +49-33200-88306. E-mail jkroll(a)rz.uni-potsdam.de
SO International Journal of Biological Macromolecules, (2003), 32 (3-5) 109-120, 46 ref.
ISSN: 0141-8130
DT Journal
LA English
AB Interactions of quercetin and rutin (quercetin-3-O-rhamnosylglucoside) with a **whey protein isolate** and purified β- **lactoglobulin** were studied, to investigate binding of the flavonoids to proteins, effects on the proteins and effects of a sugar moiety at the 3-O position on the reaction. Quercetin and rutin blocked lysine, tryptophan and cysteine residues upon reacting with **whey** proteins, resulting in structural alterations and altered bioavailability of essential amino acids. Rutin had less effect than quercetin, showing an effect of the bound sugar moiety. **Protein** derivatives displayed decreases in pH-dependent solubility, and increases in hydrophilic characteristics and in vitro proteolytic digestibility. Circular dichroism studies showed that binding of quercetin and rutin caused changes in secondary and tertiary structure of the **whey** proteins. Nutritional and functional implications of results are discussed.
CC P (Milk and Dairy Products)
CT FLAVONOIDS; LACTOGLOBULINS; VITAMINS; **WHEY**; **Nb -LACTOGLOBULIN**; BINDING; QUERCETIN; RUTIN; **WHEY PROTEINS**

L8 ANSWER 17 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:H1057 FSTA

TI Optimizing stability of orange juice fortified with **whey protein** at low pH values.
AU Kazmierski, M.; Agboola, S.; Corredig, M.
CS Correspondence (Reprint) address, M. Corredig, Food Sci. Dep., Univ. of Guelph, Guelph, Ont. N1G 2W1, Canada. E-mail Mcorredi(a)uoguelph.ca
SO Journal of Food Quality, (2003), 26 (4) 337-352, 27 ref.
ISSN: 0146-9428
DT Journal
LA English
AB Influence of temperature, heating time and pH on the stability of **whey protein** fortified Valencia orange juice was investigated by analysis of uronic acid content, degree of esterification, % transmission measurements (%T) and capillary electrophoretic analysis of the juice-**protein** supernatants. 3 commercial **protein** isolates, α- **lactalbumin** (α-lac), β- **lactoglobulin** (β-lg) and a **whey protein isolate** (WPI) were used to fortify orange juice samples. The samples were adjusted to pH 3, 4 or 5 and heated at 65, 75 or 85°C for 10, 20 or 30 min. Uronic acid content and charge of pectins showed no significant change in heat-treated samples with added proteins. The %T decreased with decreasing pH and increasing temperature and heating time for α-lac, β-lg and WPI. The lowest transmission values were shown at pH 3.0 and 85°C. Capillary electropherograms confirmed more extensive juice-**protein** interactions in WPI and β-lg added juices than in those containing α-lac, especially at low pH, resulting in more stable juice-**protein** mixtures.
CC H (Alcoholic and Non-Alcoholic Beverages)
CT FRUIT JUICE BEVERAGES; HEATING; LACTALBUMINS; LACTOGLOBULINS; PH; STABILITY; TEMPERATURE; **WHEY**; **Na -LACTALBUMIN**; **Nb -LACTOGLOBULIN**; ORANGE JUICE BEVERAGES; TEMP.; **WHEY PROTEINS**

L8 ANSWER 18 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2004:G0908 FSTA
TI Assessment of the reactivity of selected isoflavones against proteins in comparison to quercetin.
AU Rawel, H. M.; Ranters, H.; Rohn, S.; Kroll, J.
CS Correspondence (Reprint) address, J. Kroll, Inst. of Nutr. Sci., Univ. of Potsdam, D-14558 Bergholz-Rehbruecke, Germany. Fax +49 33200 88306. Tel. +49 33200 88262 E-mail jkroll(a)rz.unipotsdam.de
SO Journal of Agricultural and Food Chemistry, (2004), 52 (16) 5263-5271, 31 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Effects of different structural elements of selected isoflavones (genistein, daidzein, formononetin, prunetin, biochanin A and 2 synthetic isoflavones) on their reactivity towards soy and **whey** proteins (soy glycinin, **whey protein isolate**, β-**lactoglobulin**) were investigated. The reaction products were analysed in terms of covalent binding at the nucleophilic side chains of proteins. Changes in molecular properties of the **protein** derivatives were documented by SDS-PAGE, IEF and surface enhanced laser desorption/ionization time-of-flight MS (SELDI-TOF-MS). Structural changes induced were studied using circular dichroism. In vitro digestibility was assessed with trypsin. Occurrence of the catechol moiety, that is the 2 adjacent (ortho) aromatic hydroxyl groups on ring B of the flavonoid structural skeleton, appeared to be a prerequisite condition for covalent binding to proteins. The catechol moiety on ring A was less reactive; its absence led to a slight, non-significant reaction, although noncovalent interactions could still be possible, even when lacking this structural element. Comparison of the data is also made with those obtained with quercetin representing the flavonols.

CC G (Catering, Speciality and Multicomponent Foods)
CT FLAVONOIDS; LACTOGLOBULINS; PROTEINS; SOY PROTEINS; **WHEY**; **Nb -LACTOGLOBULIN**; ISOFLAVONES; **PROTEIN ISOLATES**; SOY GLYCININ; STRUCTURE; **WHEY PROTEINS**

L8 ANSWER 19 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2003:P2000 FSTA
TI Characterization of soluble aggregates from **whey protein isolate**.
AU Kazmierski, M.; Corredig, M.
CS Correspondence (Reprint) address, M. Corredig, Dep. of Food Sci., Univ. of Guelph, Guelph, Ont. N1G 2W1, Canada. E-mail mcorredi(a)uoguelph.ca
SO Food Hydrocolloids, (2003), 17 (5) 685-692, 33 ref.
ISSN: 0268-005X
DT Journal
LA English
AB Effects of heating on denaturation and aggregation of **whey protein isolate** (WPI) solutions were studied at neutral pH and low ionic strength. In order to study behaviour leading up to gelation, mol. weight changes of aggregates and residual native **protein** were examined in 10% (w/v) WPI solutions heated at 65, 75 and 85°C. Soluble aggregates were characterized further using preparative size exclusion chromatography (SEC) prior to dynamic light scattering and SDS-PAGE. Upon heating, similarities were detected between denaturation behaviour of WPI and isolated β- **lactoglobulin**, the main **protein** in WPI repsonsible for heat-induced aggregation; however, presence of α- **lactalbumin** in the WPI influenced the properties of heat-induced aggregates under specific conditions. Soluble aggregates of WPI produced at 65°C showed a mol. weight distribution of an average of 1.6 x 10.sup.6 g/mol compared with 4.5 x 10.sup.6 g/mol for aggregates produced at 85°C. Aggregate fractions collected by preparative SEC showed increased hydrodynamic diameter with increased heating temperature and a β- **lactoglobulin** to α- **lactalbumin** ratio of approx. 2.0, independent of temperature or duration of heating.
CC P (Milk and Dairy Products)
CT AGGLOMERATION; DENATURATION; HEATING; PHYSICAL PROPERTIES; PROTEINS; TEMPERATURE; **WHEY**; AGGREGATION; MOL. WT.; **PROTEIN ISOLATES**; TEMP.; **WHEY PROTEINS**

L8 ANSWER 20 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2003:P1904 FSTA
TI **Whey protein isolate** and glycomacropeptide recovery from **whey** using ion exchange chromatography.
AU Doultani, S.; Turhan, K. N.; Etzel, M. R.
CS Correspondence (Reprint) address, M. R. Etzel, Dep. of Food Sci., Univ. of Wisconsin, Madison, WI 53706, USA. E-mail Etzel(a)engr.wisc.edu
SO Journal of Food Science, (2003), 68 (4) 1389-1395, 30 ref.
ISSN: 0022-1147
DT Journal
LA English
AB An ion-exchange column chromatography process was developed to simultaneously manufacture **whey protein isolate** (WPI) and glycomacropeptide (GMP) from a single stream of **whey**. Cation exchange was used to recover the WPI from sweet **whey**, and the effluent was fed to an anion exchanger to recover the GMP. Nearly all of the major **whey** proteins (α- **lactalbumin**, β- **lactoglobulin**, immunoglobulin G and serum albumin) and approx. half of the total Kjeldahl N (TKN) were recovered by the cation exchanger. No GMP was recovered by the cation exchanger. The anion exchanger recovered nearly all of the GMP from the effluent of the cation exchanger, accounting for approx. half of the remaining TKN.

CC P (Milk and Dairy Products)
CT CHROMATOGRAPHY; PEPTIDES; PROTEINS; **WHEY**; GLYCOMACROPEPTIDES; ION EXCHANGE CHROMATOGRAPHY; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 21 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2003:P1638 FSTA
TI Heat-induced gelation of **whey** proteins by rheology, atomic force microscopy, and Raman scattering spectroscopy.
AU Ikeda, S.
CS Dep. of Food & Human Health Sci., Osaka City Univ., Osaka 558-8585. Tel. +81 6 6605 2862. Fax +81 6 6605 3086. E-mail ikeda(a)life.osaka-cu.ac.jp
SO Food Hydrocolloids, (2003), 17 (4) 399-406, 33 ref.
ISSN: 0268-005X
DT Journal
LA English
AB Solutions of β- **lactoglobulin** (BLG) and **whey protein isolate** (WPI) were subjected to heat-induced gelation and the resulting rheological and structural transitions were studied using atomic force microscopy, mechanical spectroscopy and Raman scattering spectroscopy. Prior to gelation, the milk proteins were dissolved in 0-0.3 mol/dm.sup.3 NaCl and adjusted to pH 2.0, 5.4 or 7.0. Heat-induced aggregation of BLG and WPI was shown to be a 2-step process at neutral pH, consisting of the formation of granular primary particles, which aggregated with each other; increases in NaCl concentration increased both the size of the primary particles and the rate of aggregation. Heat-induced gels formed by BLG alone, in the presence of 0.1 mol/dm.sup.3 NaCl became opaque upon heating and exhibited the rheological properties of self-similar networks; in the absence of added salt, translucent gels were formed at pH 7.0, with frequency-independent tan δ values. Raman spectroscopy allowed discrimination between the structures of opaque and translucent gels. [This paper was presented at the 6th International Hydrocolloids Conference in Guelph, Ont., Canada on July 15-19, 2002.]
CC P (Milk and Dairy Products)
CT GELATION; LACTOGLOBULINS; RHEOLOGICAL PROPERTIES; **WHEY**; **Nb -LACTOGLOBULIN**; STRUCTURE; **WHEY PROTEINS**

L8 ANSWER 22 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2003:P0480 FSTA
TI [Effect of temperature on **whey protein** isolated (WPI) films adsorbed at the water-oil interface.]
AU Rodriguez-Nino, M. R.; Carrera-Sanchez, C.; Rodriguez-Patino, J. M.
CS Dep. de Ingenieria Quimica, Fac. de Quimica, Univ. de Sevilla, 41012 Seville, Spain. Tel. +34 954 557 183. Fax +34 954 557 134. E-mail jmrodri(a)cica.es
SO Grasas y Aceites, (2002), 53 (3) 340-351, 30 ref.
ISSN: 0017-3495
DT Journal
LA Spanish
SL English
AB Heat-induced interfacial aggregation of a **whey protein isolate** (WPI) with a high content of β- **lactoglobulin**, previously adsorbed at the oil/water interface, was studied by interfacial dynamic characteristics (interfacial tension and surface dilational properties) performed in an automatic drop tensiometer coupled with microscopic observation and image analysis of the drop after heat treatment. Temperature (ranging between 20 and 80°C) and **protein** concentration in the aqueous bulk phase (ranging betwen 1 x10.sup.-.sup.1 and 1 x 10.sup.-.sup.5 % w/w) were studied as variables. pH and ionic strength were maintained constant at 5 and 0.05M, respectively. During heat treatment, WPI films behave typically as viscoelastic with non-zero phase

angle, but with increasing elastic characteristics as the heat treatment progresses. During isothermal treatment the surface dilational modulus E increases and the interfacial tension σ and phase angle ϕ decrease with time to a plateau value. Time dependence of E can be quantified by a 1st order equation according to 2 kinetic mechanisms. The rate of thermal changes in WPI adsorbed films increased with **protein** concentration in solution. Heat treatment produces irreversible changes in WPI adsorbed films because the interfacial characteristics do not return to the original values after cooling back to the initial temperature Significant changes in interfacial characteristics and drop image associated with interfacial WPI gelation were observed at **protein** concentration as low as 1 x 10.sup.-.sup.5 % w/w, even for heat treatment at 40°C.

CC P (Milk and Dairy Products)

CT FILMS; PHYSICAL PROPERTIES; **PROTEIN CONCENTRATES**; TEMPERATURE; **WHEY**; PHYSICOCHEMICAL PROPERTIES; TEMP.; **WHEY PROTEIN CONCENTRATES**

L8 ANSWER 23 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2003:P0325 FSTA

TI The compositional and nutritional properties of **whey protein isolate**.

AU Anon.

SO Drink Technology & Marketing, (2002), 6 (4) 6-7, 24 ref.
ISSN: 1433-1594

DT Journal

LA English

AB The production, composition and nutritional values of **whey protein** isolates (WPI) are briefly outlined. Manufactured largely by ion-exchange or ultra- and microfiltration, resulting WPI differ in composition, etc., with **protein** levels of 90-95%, lactose of 1-3 and fat of <1%. Biologically-active proteins/peptides in WPI include β- **lactoglobulin**, α- **lactalbumin**, BSA, glycomacropeptide, lactoferrin, lactoperoxidase, immunoglobulins and peptides. WPI have very high biological values.

CC P (Milk and Dairy Products)

CT NUTRITIONAL VALUES; PROCESSING; PROTEINS; PROTEINS MILK; **WHEY**; COMPOSITION; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 24 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2003:P0060 FSTA

TI Principal component similarity analysis of Raman spectra to study the effects of pH, heating, and κ-carrageenan on **whey protein** structure.

AU Alizadeh-Pasdar, N.; Nakai, S.; Li-Chan, E. C. Y.

CS Correspondence (Reprint) address, E. C. Y. Li-Chan, Fac. of Agric. Sci., Food, Nutr. & Health, Univ. of British Columbia, Vancouver, BC V6T 1Z4, Canada. Tel. (604) 822-6182. Fax (604) 822-3959. E-mail ecyl(a)interchange.ubc.ca

SO Journal of Agricultural and Food Chemistry, (2002), 50 (21) 6042-6052, 55 ref.
ISSN: 0021-8561

DT Journal

LA English

AB To provide information regarding their possible functional and physicochemical properties in dairy products and other foods, interactions between **whey** proteins and κ-carrageenan were studied as functions of temperature and pH. Raman spectroscopy was used to elucidate structural changes in β- **lactoglobulin** (BLG), **whey protein isolate** (WPI) and bovine serum albumin (BSA), at 15% concentration, at pH 5.0, 7.0 and 9.0, with heating at 80°C for 30 min, and in the presence of 0.24% κ-carrageenan. 3 data processing techniques were used to assist in identifying significant changes in Raman

spectral data. Analysis of variance showed that of 12 characteristics examined in the Raman spectra, only a few were significantly affected by pH, heating, κ-carrageenan and their interactions. These included amide I (1658 cm.sup.-.sup.1) for WPI and BLG, α-helix for BLG and BSA, β-sheet for BSA, CH stretching (2880 cm.sup.-.sup.1) for BLG and BSA, and CH stretching (2930 cm.sup.-.sup.1) for BSA. Principal component analysis reduced dimensionality of the characteristics. Heating and its interaction with κ-carrageenan were identified as the most influential in overall structure of the **whey** proteins, using principal component similarity analysis.

CC P (Milk and Dairy Products)

CT CARRAGEENANS; HEATING; PH; PROTEINS MILK; **WHEY**; STRUCTURE; **WHEY PROTEINS**

L8 ANSWER 25 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2003:N0349 FSTA

TI Impact of **whey protein** emulsifiers on the oxidative stability of salmon oil-in-water emulsions.

AU Min Hu; McClements, D. J.; Decker, E. A.

CS Correspondence (Reprint) address, E. A. Decker, Dep. of Food Sci., Chenoweth Lab., Univ. of Massachusetts, Amherst, MA 01003, USA. Tel. (413) 545-1026. Fax (413) 545-1262. E-mail edecker(a)foodsci.umass.edu

SO Journal of Agricultural and Food Chemistry, (2003), 51 (5) 1435-1439, 26 ref.
ISSN: 0021-8561

DT Journal

LA English

AB To investigate how the interfacial region of emulsion droplets influences lipid oxidation, the oxidative stability of salmon oil-in-water emulsions stabilized by **whey protein isolate** (WPI), sweet **whey** (SW), β- **lactoglobulin** (β-Lg) or α- **lactalbumin** (α-La) was evaluated. Effects of pH and temperature on oxidative stability were also investigated. In WPI-stabilized emulsions, formation of lipid hydroperoxides and headspace propanal was much lower at pH values below the **protein**'s isoelectric point (pI), at which the emulsion droplets were positively charged, compared to that at pH values above the pI, at which the emulsion droplets were negatively charged. This effect was possibly due to the ability of positively charged emulsion droplets to repel cationic Fe. In a comparison of lipid oxidation rates of WPI, SW, β-Lg and α-La stabilized emulsions at pH 3. Oxidative stability was in the order of β-Lg ≥ SW > α-La ≥WPI. Results indicated that it was possible to engineer emulsions with greater oxidative stability using proteins as emulsifiers, thereby reducing or eliminating the need for exogenous food antioxidants.

CC N (Fats, Oils and Margarine)

CT EMULSIONS; LACTALBUMINS; LACTOGLOBULINS; OXIDATION; PH; PROTEINS; SALMON; TEMPERATURE; **WHEY**; **Na -LACTALBUMIN**; **Nb -LACTOGLOBULIN**; OXIDATIVE STABILITY; **PROTEIN ISOLATES**; TEMP.

L8 ANSWER 26 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2003:J0141 FSTA

TI Viscous properties of taro flour extruded with **whey** proteins to simulate weaning foods.

AU Onwulata, C. I.; Konstance, R. P.

CS E. Reg. Res. Cent., ARS, USDA, 600 E. Mermaid Lane, Wyndmoor, PA 19038, USA. Tel. 215-233-6497. Fax 215-233-6795. E-mail conwulata(a)arserrc.gov

SO Journal of Food Processing and Preservation, (2002), 26 (3) 179-194, 25 ref.
ISSN: 0145-8892

DT Journal

LA English
AB Taro meal is unique in terms of its extremely small particle size (1-5 micron) and high mucilage or gum content, making it a possible replacement for corn or wheat starch in weaning foods. Taro meal was extruded with **whey protein concentrate** (WPC), **whey protein isolate** (WPI) or **lactalbumin** (LAC) to derive blends containing 20% **protein**, simulating the **protein** content of some weaning foods. Extrusion temperature were 100-130°C and moisture of blends was held constant at 18%. Extrudates were pulverized, made into powders and rehydrated to make pastes. Viscosities (peak, final, and breakdown) of blends before extrusion and resulting pastes were determined using a Rapid Visco Analyzer. Water solubility and absorption indices were also determined. Extrudates made from taro blends expanded more than extrudates from taro meal alone, were easier to grind into powders and rehydrated readily in water to form pastes. Before extrusion, peak viscosities were 5000, 2600, 1600 and 1600 cP for taro meal, taro with WPI, taro with WPC and taro with LAC, respectively. After extrusion, corresponding viscosities were 110, 65, 70 and 90 cP, respectively. Taro extrudates without **protein** absorbed most water, and were more soluble than products containing **whey** proteins. Both extrusion cooking and addition of **whey** proteins significantly reduced ($P < 0.05$) the gummy properties of taro mucilage. WPI and taro pastes had the best consistency for use in weaning foods.
CC J (Fruits, Vegetables and Nuts)
CT EXTRUSION; FLOURS; FUNCTIONAL PROPERTIES; INFANT FOODS; **PROTEINS MILK**; TARO; VISCOSITY; **WHEY**; EXTRUSION COOKING; MEAL; WEANING FOODS; **WHEY PROTEINS**

L8 ANSWER 27 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2002:P1689 FSTA
TI Physical and chemical interactions in cold gelation of food proteins.
AU Alting, A. C.; Jongh, H. H. J. de; Visschers, R. W.; Simons, J. W. F. A.
CS Wageningen Cent. for Food Sci., Diedenweg 20, 6700 AN Wageningen, Netherlands. Tel. +31 318 659571. Fax +31 318 650400. E-mail Alting(a)NIZO.nl
SO Journal of Agricultural and Food Chemistry, (2002), 50 (16) 4682-4689, 28 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Cold gelation of **whey** proteins induced by a decrease in pH is a 2-step process. After heat-induced **protein** aggregation, gelation is established at ambient temperature by a gradual lowering of the pH. To demonstrate the importance of electrostatic interactions between aggregates during gelation, β- **lactoglobulin** aggregates with a decreased pI were prepared via succinylation of primary amino groups, and cold gelation of the modified aggregates was studied. Kinetics of pH-induced gelation were affected markedly with pH gelation curves shifting to lower pH after succinylation. With increasing modification, pH of gelation decreased to approx. 2.5. In contrast, non-modified aggregates gelled at approx. pH 5. Increasing the pI of β-**lactoglobulin** via methylation of carboxylic acid groups resulted in gelation at more alkaline pH values. Comparable results were obtained with **whey protein isolate**. At low pH, disulphide bonds between modified aggregates did not form after gelation, and gels displayed both syneresis and spontaneous gel fracture, resembling the morphology of thiol-blocked **whey protein isolate** gels. Results clearly demonstrated the importance of the net electric charge of the aggregates during pH-induced gelation. In addition, the absence of disulphide bond formation during low-pH gelation was demonstrated with the modified aggregates.
CC P (Milk and Dairy Products)

CT ELECTRICAL PROPERTIES; GELATION; LACTOGLOBULINS; PH; **Nb -LACTOGLOBULIN**; ELECTROSTATIC INTERACTIONS; SUCCINYLATION

L8 ANSWER 28 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2002:P1164 FSTA
TI Effects of storage time and temperature on the solubility of **whey protein isolate**.
AU Yildirim, Z.
CS Dep. of Food Eng., Fac. of Agric., Univ. of Gaziosmanpasa, Tokat, Turkey
SO Milchwissenschaft, (2002), 57 (5) 269-271, 16 ref.
ISSN: 0026-3788
DT Journal
LA English
SL German
AB Effects of storage time (up to 3 months) and temperature (22, 4 or -15°C) on solubility of **whey protein isolate** (WPI) at pH 2-9 were evaluated. WPI contained bovine serum albumin, α- **lactalbumin** and β- **lactoglobulin**. Storage period did not significantly affect solubility of WPI, the highest value being achieved at 0 time and pH 9 (99.6% solubility). As storage progressed, solubility decreased slightly. WPI solubility was slightly higher upon frozen storage, but differences were not significant. Other than samples at pH 5, solubility values were >94%. At pH 5, values were 84.3-97.6%, as the isoelectric point of **whey** proteins is approx. pH 5.
CC P (Milk and Dairy Products)
CT PH; PROTEINS; PROTEINS MILK; SOLUBILITY; STORAGE; TEMPERATURE; **WHEY**; **PROTEIN ISOLATES**; TEMP.; **WHEY PROTEINS**

L8 ANSWER 29 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2002:P0411 FSTA
TI Studies of the binding of α- **lactalbumin** to immobilized peptide ligands.
AU Gurgel, P. V.; Carbonell, R. G.; Swaisgood, H. E.
CS Correspondence (Reprint) address, H. E. Swaisgood, Dep. of Food Sci., Box 7624, N. Carolina State Univ., Raleigh, NC 27695-7624, USA. Tel. 919 515 2256. Fax 919 515 7124. E-mail swaisgood(a)ncsu.edu
SO Journal of Agricultural and Food Chemistry, (2001), 49 (12) 5765-5770, 20 ref.
ISSN: 0021-8561
DT Journal
LA English
AB With the aim of developing a selective process to purify α-lactalumin from **whey protein isolate** (WPI), the mechanism of binding of α- **lactalbumin** to the peptide ligands was investigated. The ligands tested were Trp-His-Trp-Arg-Lys-Arg (WHWRKR) and its variants HWRKR and acetylated WHWRKR, all immobilized on a polymethacrylate chromatographic resin. The presence of 2 temperature-dependent binding mechanisms and a temp-independent mechanism was demonstrated. Injections of different forms of α- **lactalbumin** (apo-α- **lactalbumin** and Asp87Ala mutant α- **lactalbumin**) behaved similarly to native α- **lactalbumin**, while lysozyme showed little or no binding to the WHWRKR and acetylated WHWRKR resins. Use of consecutive injections of WPI with limited elution was an effective process for isolation of α- **lactalbumin** from WPI.
CC P (Milk and Dairy Products)
CT LACTALBUMINS; PEPTIDES; PROTEINS; PROTEINS MILK; PURIFICATION; **WHEY**; **Na -LACTALBUMIN**; BINDING; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 30 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2002:P0220 FSTA
TI Mechanical characterization of network formation during heat-induced

gelation of **whey protein** dispersions.
AU Ikeda, S.; Nishinari, K.; Foegeding, E. A.
CS Dep. of Food & Nutr., Osaka City Univ., Osaka 558-8585, Japan. E-mail ikeda(a)life.osaka-cu.ac.jp
SO Biopolymers, (2001), 56 (2) 109-119, 57 ref.
ISSN: 0006-3525
DT Journal
LA English
AB Steady shear flow and dynamic viscoelastic properties of **whey protein isolate** and β- **lactoglobulin** dispersions were measured during heat-induced gelation in the presence or absence of NaCl, and results were compared. Data showed that at 20°C, both **protein** dispersions produced mechanical spectra over the frequency (ω) range 1-100 rad/s in which the storage modulus (G') was greater than the loss modulus (G''), indicating a solid-like nature. At this temperature, addition of 0.1M NaCl to the dispersions did not affect their spectra, however, the presence of NaCl had an important influence during gelation of proteins at 70°C. In the absence of NaCl, β- **lactoglobulin** dispersions showed a solid-like to fluid-like transition prior to gelling in which the ratio of G' to G'' decreased, and did not exhibit parallel power law behaviour at the gelling point. However, in the presence of NaCl, mechanical spectra characteristic of a solid-like form were produced from the β- **lactoglobulin** dispersions throughout gelation while at the gelling point parallel power laws (G' = G'' = ω) were satisfied, indicating a self-similar or fractal network structure. When heating time was increased, β- **lactoglobulin** gels in the presence and absence of NaCl deviated from and approached the parallel power laws, respectively, suggesting that reactions occurring after gelation may also influence gel structure. **Whey protein** isolates exhibited a sol to gel transition (percolation-type) only in the absence of NaCl.
CC P (Milk and Dairy Products)
CT DISPERSIONS; GELATION; LACTOGLOBULINS; PROTEINS MILK; RHEOLOGICAL PROPERTIES; SALT; **WHEY**; **Nb -LACTOGLOBULIN**; NACL; **WHEY PROTEINS**

L8 ANSWER 31 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2002:P0212 FSTA
TI New biological function of bovine α- **lactalbumin**: protective effect against ethanol- and stress-induced gastric mucosal injury in rats.
AU Matsumoto, H.; Shimokawa, Y.; Ushida, Y.; Toida, T.; Hayasawa, H.
CS Biochem. Res. Lab., Morinaga Milk Industry Co. Ltd., Zama, Kanagawa 228-8583, Japan. Fax +81-46-252-3059. E-mail hi_matum(a)morinagamilk.co.jp
SO Bioscience, Biotechnology, and Biochemistry, (2001), 65 (5) 1104-1111, 35 ref.
ISSN: 0916-8451
DT Journal
LA English
AB Effects of the major milk proteins on gastric mucosal injury were investigated using 2 acute ulcer models in Wistar rats. Gastric mucosal injury was induced by intragastric 60% ethanol-HCl or water-immersion restraint stress (23°C, 7 h). Casein, β- **lactoglobulin**, bovine serum albumin, γ-globulins (immunoglobulins), **whey protein isolate** (WPI) or α- **lactalbumin** (α-LA) was administered orally 30 min before induction of gastric injury. Among the milk proteins tested, α-LA showed a marked protective effect against ethanol-induced gastric injury, with the same potency as that of the antiulcer agent Selbex. WPI, which contained 25% α-LA, also protected against gastric injury, while casein showed no effect. Comparative studies on the protective effect of WPI, β-

lactoglobulin, α-LA, bovine serum albumin and γ-globulins, on the basis of their contents in WPI, revealed that α-LA was responsible for the protective effect of WPI, being approx. 4-fold more effective than WPI itself. α-LA showed dose-dependent protection against gastric injury. Subcutaneous injection with indomethacin (10 mg/kg body weight), a potent inhibitor of endogenous prostaglandin synthesis, resulted in a significant reduction in the protective effect of α-LA. It is concluded that α-LA has marked antiulcer activity and may serve to protect against gastric mucosal injury, in part through endogenous prostaglandin synthesis.

CC P (Milk and Dairy Products)

CT DAMAGE; HUMAN PHYSIOLOGY; LACTALBUMINS; PROTEINS MILK; **Na -LACTALBUMIN**; ANIMAL MODELS; GASTROINTESTINAL TRACT; INJURY; MILK PROTEINS

L8 ANSWER 32 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2002:P0015 FSTA

TI Rheological characterization of a gel formed during extensive enzymatic hydrolysis.

AU Doucet, D.; Gauthier, S. F.; Foegeding, E. A.

CS Correspondence (Reprint) address, E. A. Foegeding, Dep. of Food Sci., N. Carolina State Univ., Box 7624, Raleigh, NC 27695-7624, USA. E-mail allen_foegeding(a)ncsu.edu

SO Journal of Food Science, (2001), 66 (5) 711-715, 36 ref.
ISSN: 0022-1147

DT Journal

LA English

AB Gelation of **whey protein isolate** (WPI) during extensive hydrolysis by Alcalase 2.4L® (a liquid preparation of subtilisin Carlsberg) was investigated. Rheological properties of the enyzme-induced gels were characterized and compared to those of heat-induced gels. During gelation, degradation of **whey** proteins was monitored by size exclusion chromatography and aggregation development by turbidimetry. Extensive hydrolysis of WPI by Alcalase 2.4L® caused a marked increase in turbidity and viscosity. A gel was formed after the degree of hydrolysis was ≥18%, coinciding with <16% β- **lactoglobulin** and 14% α- **lactalbumin** remaining unhydrolysed. Comparing heat-induced and enzyme-induced WPI gels revealed that both mechanisms require the formation of aggregates before gelation. Frequency and strain dependence indicated that both gels could be considered as strong, physical gels.

CC P (Milk and Dairy Products)

CT AGGLOMERATION; GELATION; GELS; PROTEINS; PROTEINS MILK; RHEOLOGICAL PROPERTIES; VISCOSITY; **WHEY**; AGGREGATION; HYDROLYSIS; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 33 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2002:G0421 FSTA

TI Texture and structure of some globular **protein** gels.

AU Mleko, S.; Janas, P.; Pikus, S.

CS Katedra Tech. Przemyslu Rolno-Spozywczego i Przechowalnictwa, Akad. Rolnicza, ul. Akademicka 13, 20-950 Lublin, Poland. E-mail mleko(a)hortus.ar.lublin.pl

SO Zywnosc, (2001), 8 (3) 16-23, 7 ref.
ISSN: 1425-6959

DT Journal

LA Polish

SL English

AB Relationships between texture and structure of **protein** gels were studied. Studies were conducted on **whey protein isolate** (WPI), bovine serum albumin (BSA), swine serum albumin (SSA) and β- **lactoglobulin** (β-LG). Gel texture was assessed by measuring breaking force and shear stress at fracture. These

parameters were assessed in **protein** gels at pH in the range 3-11. Highest values for shear stress at fracture were obtained at pH 8 in all gels. Although gels from different proteins exhibited similar stress values, pronounced differences in microstructure were observed. Maximum shear stress values were determined by **protein** concentration

CC G (Catering, Speciality and Multicomponent Foods)

CT GELS; MECHANICAL PROPERTIES; PROTEINS; TEXTURE; SHEAR STRENGTH; STRUCTURE

L8 ANSWER 34 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2001(08):A1389 FSTA

TI Application of PRODAN fluorescent probe to measure surface hydrophobicity of proteins interacting with κ-carrageenan.

AU Alizadeh-Pasdar, N.; Li-Chan, E. C. Y.

CS Correspondence (Reprint) address, E. C. Y. Li-Chan, Food Sci. Building, Fac. of Agric., Univ. of British Columbia, Vancouver, BC V6T 1Z4, Canada. Tel. +1 604 822 6182. Fax +1 604 822 3959. E-mail ecyl(a)interchange.ubc.ca

SO Food Hydrocolloids, (2001), 15 (3) 285-294, 48 ref. ISSN: 0268-005X

DT Journal

LA English

AB Use of an uncharged fluorescent probe, 6-propionyl-2-(N,N-dimethylamino)naphthalene (PRODAN), to measure surface hydrophobicity of **whey** proteins as affected by their interactions with κ-carrageenan was investigated under various conditions of pH and heat treatment. Solutions of κ-carrageenan with bovine serum albumin, β- **lactoglobulin** or **whey protein isolate** were prepared using polysaccharide to **protein** ratios of 1:1.2, 1:6 and 1:62.5 at pH 3, 5, 7, and 9 and the effect of heating at 80°C for 30 min was also examined. Significant effects ($P < 0.05$) on the surface hydrophobicities of all proteins were observed with heating, pH and addition of κ-carrageenan at all levels and significant interactions between these factors on surface hydrophobicity were detected. In general, at pH 9 compared with lower pH values, proteins had higher surface hydrophobicity and were influenced more markedly by heating and addition of polysaccharide. On heating the mixtures, hydrophobicity decreased at pH 3 but increased at higher pH. It is concluded that PRODAN is potentially useful as an uncharged fluorescent probe for determining the surface hydrophobicity of globular proteins in the presence or absence of κ-carrageenan and as a function of heating at different pH.

CC A (Food Sciences)

CT ALBUMINS; CARRAGEENANS; FLUORESCENCE; HEATING; LACTOGLOBULINS; PH; PHYSICAL PROPERTIES; PROTEINS; PROTEINS MILK; **WHEY**; **Nb -LACTOGLOBULIN**; BOVINE SERUM ALBUMIN; HYDROPHOBICITY; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 35 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2001(07):A1289 FSTA

TI Flavor release.

AU Roberts, D. D. (Editor); Taylor, A. J. (Editor)

CS Great Clarendon St., Oxford OX2 6DP, UK; Oxford University Press. Tel. +44 (0)1865 556767. Fax +44 (0)1865 556646. Price £100 Nestle Research Centre, PO Box 44, Vers-Chez-les-Blanc, 1000 Lausanne 26, Switzerland

SO (2000), xii + 484pp. ISBN 0-8412-3692-5, many ref.

DT Book

LA English

AB This book, number 763 in the American Chemical Society symposium series, presents original research articles relating to detection and interaction of flavour compounds in foods. Following a rationale for the study of flavour release, 34 chapters are presented in 3 sections: In vivo and dynamic flavor release methodology (17 chapters relating to methods for

measuring flavour release from foods during mastication, including chapters on key fruit aroma compounds, roasting coffee and mal-odours from the mouth, modelling of flavour release, flavour release from emulsions, plant wounds as a source of flavour compounds, and control of release of lipophilic flavour compounds in low fat foods); Interactions of flavor compounds with food components (11 chapters regarding interactions of flavour and/or aroma compounds with starch, β-cyclodextrins, proteins, β- **lactoglobulin**, legumin and milk, effects of maltodextrin on hexyl acetate-legumin interaction, release of volatile compounds from sunflower oil, **whey protein isolate** gels and oil-in water emulsions, and effect of beverage base conditions on flavour release); and Relating analytical results to human perception (6 chapters discussing carvone and mint flavour, sweetness and salivary sweetener concentration, effect of base and processing on flavour release from snacks, aroma compound release from roasted coffee, flavour release from dairy gels and a proposed aroma stimulus index). An author index and a 44-pp. subject index are included.
CC A (Food Sciences)
CT ANALYTICAL TECHNIQUES; BOOKS; FLAVOUR; FLAVOUR COMPOUNDS; FOODS

L8 ANSWER 36 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2001(04):P0585 FSTA
TI Separation of bovine immunoglobulin G and glycomacropeptide from dairy **whey**.
AU Yue Xu; Sleigh, R.; Hourigan, J.; Johnson, R.
CS Food Tech. Cent., Productivity & Standards Board, 1 Science Park Dr., 118221 Singapore. Tel. +65-8701840. Fax +65-7759725. E-mail mxy(a)psb.gov.sg
SO Process Biochemistry, (2000), 36 (5) 393-399, 22 ref.
ISSN: 0032-9592
DT Journal
LA English
AB A polystyrene matrix anion exchanger (IRA 93) and ultrafiltration (using an Amicon YM100 membrane, mol. weight cut-off 100 kDa) were used to selectively remove the major proteins from **whey**, such as α- **lactalbumin**, β- **lactoglobulin** and bovine serum albumin, allowing concentration of immunoglobulins (Ig). When applied to HCl-casein and colostral **whey**, IgG contents of 43.3 and 93%, respectively, were obtained. Utilizing the fact that glycomacropeptide (GMP) selectively adsorbs to IRA 93 at pH 4.7, a process is also described whereby Ig, GMP and **whey protein isolate** were separated from dairy **whey**.
CC P (Milk and Dairy Products)
CT GLOBULINS; ION EXCHANGE; PROTEINS MILK; SEPARATION; ULTRAFILTRATION; **WHEY**; IMMUNOGLOBULINS; **WHEY PROTEINS**

L8 ANSWER 37 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2001(03):P0485 FSTA
TI Effect of partial hydrolysis with an immobilized proteinase on thermal gelation properties of β- **lactoglobulin** B.
AU Otte, J.; Lomholt, S. B.; Ipsen, R.; Qvist, K. B.
CS Dep. of Dairy & Food Sci., Royal Vet. & Agric. Univ., DK-1958 Frederiksberg C, Denmark. E-mail jo(a)kvl.dk
SO Journal of Dairy Research, (2000), 67 (4) 597-608, 23 ref.
ISSN: 0022-0299
DT Journal
LA English
AB Effects of partial hydrolysis with an immobilized proteinase from Bacillus licheniformis on thermal gelation of isolated β- **lactoglobulin** B were examined. Gelation behaviour was determined by dynamic rheological measurements (small deformation) and the gels were characterized with respect to microstructure and water-holding properties. A fine-stranded

gel with a complex modulus of approx. 2000 Pa was formed from **lactoglobulin** (50 g/l in 75mM Tris-HCl, pH 7.5). Limited hydrolysis prior to thermal gelation resulted in coarser gels with thicker **protein** strands and larger pores. Gel structure was correlated with permeability, proton mobility and water-holding capacity. Total gel stiffness increased with low degrees of hydrolysis, but decreased after prolonged hydrolysis. Maximal gel stiffness was 1.5-fold that of gels made from unhydrolysed β- **lactoglobulin**. This was much lower than the stiffening effect obtained after partial hydrolysis of **whey protein isolate**, showing that the gel strengthening effect of partial hydrolysis was dependent on **protein** composition and/or hydrolysis and gelation conditions. A mechanism to explain the observed effects of hydrolysis on gelation and gel properties is presented.

CC P (Milk and Dairy Products)

CT GELATION; LACTOGLOBULINS; PROTEINASES; **Nb -LACTOGLOBULIN**; HYDROLYSIS

L8 ANSWER 38 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(12):S1702 FSTA

TI Oxidatively induced chemical changes and interactions of mixed myosin, β- **lactoglobulin** and soy 7S globulin.

AU Gang Liu; Youling L. Xiong

CS Correspondence (Reprint) address, Youling L. Xiong, Food Sci. Sect., Dep. of Animal Sci., Univ. of Kentucky, Lexington, KY 40546, USA

SO Journal of the Science of Food and Agriculture, (2000), 80 (11) 1601-1607, 42 ref.
ISSN: 0022-5142

DT Journal

LA English

AB **Whey** and soy proteins are used as functional ingredients in meat products to improve physical properties. Chemical properties and interactions of myosin (from chicken pectoralis muscle), β- **lactoglobulin** (BLG; from **whey protein isolate**) and 7S soy globulin (7S; from defatted soy flakes), in their individual and composite systems, were examined after exposure to oxidizing free radicals generated from an FeCl.sub.3/H.sub.2O.sub.2/ascorbate system. Properties evaluated included **protein** oxidation, **protein** carbonyls levels, free amines, sulphydryls and disulphide bonds, and SDS-PAGE patterns of oxidized and non-oxidized **protein** samples. Results indicated that myosin was more susceptible to oxidation than BLG or 7S. Free radicals were able to modify amino acid residue side chains, altering chemical properties and inducing formation of cross-linked aggregates in binary mixtures including myosin. Oxidative changes occurred largely during the first hour of incubation; oxidatively induced association between myosin and BLG or 7S could also result from non-covalent forces such as hydrophobic interactions. It is suggested that such physicochemical changes may affect the functionality of meat products.

CC S (Meat, Poultry and Game)

CT FUNCTIONAL PROPERTIES; LACTOGLOBULINS; MEAT PRODUCTS; MYOSIN; OXIDATION; SOY PROTEINS; **Nb -LACTOGLOBULIN**; SOY GLOBULINS

L8 ANSWER 39 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 2000(11):P1794 FSTA

TI Renneting properties of transglutaminase-treated milk.

AU Lorenzen, P. C.

CS Fed. Dairy Res. Cent. Kiel, Inst. for Chem. & Physics, Hermann-Weigmann-Str. 1, 24103 Kiel, Germany

SO Milchwissenschaft, (2000), 55 (8) 433-437, 22 ref.
ISSN: 0026-3788

DT Journal

LA English

AB Renneting properties of transglutaminase (**protein**-glutamine γ-glutamyltransferase)-treated milk were studied. Renneting ability of milk decreased with increasing degree of crosslinking. Increased crosslinking was a result of increased heat impact and incubation time with transglutaminase, respectively. High heating of milk (92°C, 5 min) followed by enzyme treatment led to complete loss of renneting ability. Contents of sialic acid decreased linearly when high-heated milk was mixed with an increasing amount of high-heated and transglutaminase-treated (40°C, 120 min) milk. Model examinations using calcium caseinate and **whey protein isolate** as substrates were performed to analyse the mechanism of the decreased renneting ability. It is assumed that loss of renneting ability of transglutaminase-treated milk is induced by 'rface sealing' of casein micelles with cross-linked **whey** proteins, especially β- **lactoglobulin**. Additionally, the model investigations showed that rennet gels from transglutaminase-treated calcium caseinate dispersions have a different structure and consistency as well as appearance from rennet gels from untreated caseinate.
CC P (Milk and Dairy Products)
CT COAGULATION; MILK; TRANSFERASES; **PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES**; RENNETABILITY

L8 ANSWER 40 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2000(09):P1422 FSTA
TI Mechanical properties and microstructure of heat-set **whey protein** emulsion gels: effect of emulsifiers.
AU Chen, J.; Dickinson, E.; Langton, M.; Hermansson, A. M.
CS Correspondence (Reprint) address, E. Dickinson, Procter Dep. of Food Sci., Univ. of Leeds, Leeds LS2 9JT, UK
SO Lebensmittel-Wissenschaft und -Technologie, (2000), 33 (4) 299-307, 35 ref.
ISSN: 0023-6438
DT Journal
LA English
AB Rheological properties of heat-set **whey protein** emulsion gels, with or without emulsifiers (oil- and water-soluble), were investigated and gel structure examined using confocal laser scanning microscopy (CLSM). Effects of filler particle surface character on microstructure and rheology were also evaluated. Emulsions were prepared with 300 ml/l triolein oil (pH 7.0), mixed with either a water soluble surfactant (20 g/kg Tween 20) or with 8 g/kg pure β- **lactoglobulin**. Commercial **whey protein isolate** (>95% β- **lactoglobulin**) was added to the emulsion during the aqueous phase (80 g/kg) prior to heat treatment (85°C). Reactivity of the filler particles, determined by the composition of the adsorbed layer around emulsion droplets, was used to elucidate effects of Tween 20 and glycerol monopalmitate on rheology of the gel emulsions. CLSM showed that coalescence of the emulsion droplets was enhanced during thermal treatment when emulsifiers were present. Microstructure of emulsion gels containing Tween 20 was significantly phase-separated.
CC P (Milk and Dairy Products)
CT EMULSIFIERS; EMULSIONS; GELS; PROTEINS MILK; RHEOLOGICAL PROPERTIES; **WHEY**; MICROSTRUCTURE; **WHEY PROTEINS**

L8 ANSWER 41 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2000(06):P0939 FSTA
TI Protease-induced gelation of unheated and heated **whey** proteins: effects of pH, temperature, and concentrations of **protein**, enzyme and salts.
AU Otte, J.; Schumacher, E.; Ipsen, R.; Ju, Z. Y.; Qvist, K. B.
CS Dep. of Dairy & Food Sci., Royal Vet. & Agric. Univ., DK-1958 Frederiksberg C, Denmark. Tel. +45-35-28-31-89. Fax +45-35-28-31-90.

E-mail jo(a)kvl.dk
SO International Dairy Journal, (1999), 9 (11) 801-812, 45 ref.
ISSN: 0958-6946
DT Journal
LA English
AB Effects of pH, temperature and salt, **protein** and proteinase concentration on enzyme-induced gelation of **whey protein** **isolate** were determined. 1-9% solutions of non-heated or heat denatured (80°C, 30 min) **whey protein** **isolate** were treated with a serine proteinase from Bacillus licheniformis. A range of conditions (pH 5-8, 30-60°C, 0-60 min, 0-500mM NaCl, 0-30mM CaCl.sub.2, 0.0-3.0 enzyme:substrate ratio) was used for the hydrolysis. Gelation properties and extent of hydrolysis were then measured. Peptide, aggregate and β- **lactoglobulin** levels were used as indicators of hydrolysis. Gelation at pH 7.0 and 50°C with 1% enzyme and no salt added occurred with denatured and native **whey protein** concentration as low as 0.5 and 2%, respectively. Increases in **protein** concentration, enzyme concentration or temperature increased gelation. Effects of pH were different for native and denatured **whey protein isolate**, e.g. at pH <6.2, gelation did not occur with native **whey protein**, but, at pH <6.0, gelation of denatured **whey protein** was almost instantaneous. Effects of pH on gelation were attributed to effects on enzyme activity and on the net charge of the **whey** **protein**. Gelling time decreased with the addition of up to 15mM CaCl.sub.2 or 100mM NaCl; however, increasing salt concentration further resulted in a more coagulum-like gel. With all conditions used, gelation of the denatured **whey protein isolate** was more rapid than that of the native **protein** and resulted in stronger gels.
CC P (Milk and Dairy Products)
CT BACILLUS; CALCIUM; CHLORIDES; GELATION; HEATING; PH; PROTEINASES; PROTEINS MILK; SALT; TEMPERATURE; **WHEY**; BACILLUS LICHENIFORMIS; CACL2; NACL; TEMP.; **WHEY PROTEINS**

L8 ANSWER 42 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2000(06):G0259 FSTA
TI Comparison of **protein** surface hydrophobicity measured at various pH values using three different fluorescent probes.
AU Alizadeh-Pasdar, N.; Li-Chan, E. C. Y.
CS Correspondence (Reprint) address, C. Y. Li-Chan, Fac. of Agric. Sci., Food Sci. Building, Univ. of British Columbia, Vancouver, BC V6T 1Z4, Canada. Tel. (604) 822-6182. Fax (604) 822-3959. E-mail ecyl(a)interchange.ubc.ca
SO Journal of Agricultural and Food Chemistry, (2000), 48 (2) 328-334, 51 ref.
ISSN: 0021-8561
DT Journal
LA English
AB The influence of type of fluorescent probe on surface hydrophobicity values determined for 3 native and heated proteins was assessed using uncharged (6-propionyl-2-(N,N-dimethylamino)-naphthalene or PRODAN) vs. anionic aliphatic (cis-parinaric acid or CPA) and aromatic (1-anilinonaphthalene-8-sulphonic acid or ANS) probes. Surface hydrophobicities of **whey protein isolate**, β- **lactoglobulin**, and bovine serum albumin under heated (80°C for 30 min) and unheated conditions and at varying pH values (3.0, 5.0, 7.0 and 9.0) were measured using ANS, CPA and PRODAN. ANS and CPA yielded opposing results for the effects of pH and heating on **protein** hydrophobicity. Hydrophobicity was lower at pH 3.0 than at other pH values for all proteins measured by PRODAN, whereas the values measured by ANS and CPA at pH 3.0 were quite high compared to those at

other pH values, suggesting the influence of electrostatic interactions on anionic probe-**protein** binding. Results suggest that the presence or absence of a permanent charge as well as the aromatic and aliphatic nature of fluorescent probes can affect **protein** hydrophobicity values measured under various pH conditions.
CC G (Catering, Speciality and Multicomponent Foods)
CT ALBUMINS; FLUORESCENCE; HEATING; LACTOGLOBULINS; PH; PHYSICAL PROPERTIES; PROTEINS MILK; **WHEY**; **Nb -LACTOGLOBULIN**; BOVINE SERUM ALBUMIN; HYDROPHOBICITY; **WHEY PROTEINS**

L8 ANSWER 43 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 2000(01):P0043 FSTA
TI Interfacial ageing effect on the rheology of a heat-set **protein** emulsion gel.
AU Chen, J.; Dickinson, E.
CS Correspondence (Reprint) address, E. Dickinson, Procter Dep. of Food Sci., Univ. of Leeds, Leeds LS2 9JT, UK. Tel. +44-1132-332956. Fax +44-1132-332982. E-mail e.dickinson(a)leeds.ac.uk
SO Food Hydrocolloids, (1999), 13 (5) 363-369, 33 ref.
ISSN: 0268-005X
DT Journal
LA English
AB Viscoelasticity of heat-set **whey protein** emulsion gels was examined and effects of emulsion age prior to thermal treatment assessed. Emulsions were prepared from pure β- **lactoglobulin** as sole emulsifier. After emulsification, commercial **whey protein isolate** (WPI) was dissolved in the emulsion aqueous phase immediately prior to heating. Gels prepared from fresh and aged emulsions containing added **whey protein** were studied using small- and large-deformation techniques and effects of ageing of the covering **lactoglobulin** monolayer at the droplet surface on viscoelasticity of heat-set WPI gels were measured. A highly concentrate emulsion gel was also evaluated, to determine effects of ageing on direct interlayer bonding between emulsion droplets. Aged emulsion droplets were less active in enhancing gel viscoelasticity than fresh ones. It was assumed that the **protein** monolayer became flattened at the droplet surface as a result of unfolding and slow polymerization, leading to strengthening of lateral cross-links within the monolayer prior to heat treatment. Thus these β-**lactoglobulin**-covered droplets had less chemical affinity for the developing gel matrix and were less able to become mechanically incorporated into gel networks. At large deformations, emulsion gels with 30 volume% oil showed a hybrid particle/biopolymer gel character, but the equivalent emulsion gel prepared from aged droplets appeared to be a more classical particle gel. The heat-set concentrate gel with 59 volume% oil exhibited a very high storage modulus, with a gel network formed mainly through direct links between surfaces of **protein**-coated droplets via interlayer disulphide bonding. This emulsion behaved as a typical particle gel with a very short linear regime and shear-weakening behaviour; ageing had less effect on this gel system.
CC P (Milk and Dairy Products)
CT AGEING; EMULSIONS; GELS; LACTOGLOBULINS; PROTEINS MILK; RHEOLOGICAL PROPERTIES; **WHEY**; **Nb -LACTOGLOBULIN**; VISCOELASTICITY; **WHEY PROTEINS**

L8 ANSWER 44 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1999(11):P1586 FSTA
TI Adsorption of **whey protein isolate** at the oil-water interface as a function of processing conditions: a rheokinetic study.
AU Rodriguez-Patino, J. M.; Rodriguez-Nino, M. R.; Carrera Sanchez, C.
CS Dep. de Ingenieria Quimica, Fac. de Quimica, Univ. de Sevilla, c/Profesor Garcia Gonzalez s/n, 41012 Seville, Spain. E-mail jmrodri(a)cica.es

SO Journal of Agricultural and Food Chemistry, (1999), 47 (6) 2241-2248, 19 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Surface dynamic properties (interfacial tension and surface dilational properties) of a **whey protein isolate** with a high content of β- **lactoglobulin** (WPI) adsorbed on the oil-water interface were studied as a function of adsorption time. Experiments were performed at a constant temperature (20°C), pH (5) and ionic strength (0.05M). Surface rheological parameters and interfacial tension were measured as a function of WPI concentration (ranging from 1 x 10.sup.-.sup.1 to 1 x 10.sup.-.sup.5% w/w) and different processing factors (effect of convection and heat treatment). Interfacial pressure, π, and surface dilational modulus, E, increased and phase angle, ϕ, decreased with time, θ, which should be associated with WPI adsorption. These phenomena were related to diffusion of the **protein** towards the interface (at short adsorption time) and to **protein** unfolding and/or **protein-protein** interactions (at long-term adsorption) as a function of **protein** concentration in solution and processing conditions.
CC P (Milk and Dairy Products)
CT LACTOGLOBULINS; PROTEINS; PROTEINS MILK; RHEOLOGICAL PROPERTIES; SORPTION; **WHEY**; **Nb -LACTOGLOBULIN**; ADSORPTION; **PROTEIN ISOLATES**; **WHEY PROTEINS**

L8 ANSWER 45 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1999(08):G0326 FSTA
TI Modification of rheological properties of **whey protein** isolates by limited proteolysis.
AU Huang, X. L.; Catignani, G. L.; Swaisgood, H. E.
CS Correspondence (Reprint) address, H. E. Swaisgood, Dep. of Food Sci., Southeast Dairy Food Res. Cent., North Carolina State Univ., Raleigh, NC 27695-7624, USA
SO Nahrung, (1999), 43 (2) 79-85, 36 ref.
ISSN: 0027-769X
DT Journal
LA English
AB **Whey protein isolate** (WPI) was subjected to limited tryptic hydrolysis and effects of the limited hydrolysis on rheological properties of WPI were examined and compared with those of untreated WPI. At 10% concentration (w/v in 50mM TES buffer, pH 7.0, containing 50mM NaCl), both WPI and enzyme-treated WPI (EWPI) formed heat-induced viscoelastic gels. However, EWPI formed weaker gels (lower storage modulus) than WPI gels. Moreover, a lower gelation point (77°C) was obtained for EWPI than WPI which gelled at 80°C only after holding for 1.4 min. Thermal analysis and aggregation studies indicated that limited proteolysis resulted in changes in denaturation and aggregation properties. As a consequence, EWPI formed particulated gels, while WPI formed fine-stranded gels. In keeping with the formation of particulate gels, texture profile analysis (TPA) of the heat-induced gels (at 80°C for 30 min) revealed that EWPI gels possessed significantly higher ($P < 0.05$) cohesiveness, hardness, gumminess and chewiness but did not fracture at 75% deformation. Results suggest that the domain peptides, especially β- **lactoglobulin** domains released by limited proteolysis, were responsible for the altered gelation properties.
CC G (Catering, Speciality and Multicomponent Foods)
CT GELS; PROTEINASES; PROTEINS MILK; PROTEOLYSIS; RHEOLOGICAL PROPERTIES; **WHEY**; TRYPSIN; **WHEY PROTEINS**

L8 ANSWER 46 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1998(09):P1551 FSTA
TI Mechanical properties, water vapor permeability, and moisture contents of β- **lactoglobulin** and **whey protein** films using multivariate analysis.
AU Anker, M.; Stading, M.; Hermansson, A. M.
CS SIK, Swedish Inst. for Food & Biotech., PO Box 5401, S-402 29 Goeteberg, Sweden
SO Journal of Agricultural and Food Chemistry, (1998), 46 (5) 1820-1829, 37 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Mechanical and barrier properties of β- **lactoglobulin** (β-Lg) and **whey protein isolate** (WPI) films were studied using sorbitol as a plasticizer. Films were cast from heated aqueous solutions and dried in a climate chamber at 23°C and 50% RH for 16 h. The multivariate analysis used proved to be a valuable tool for evaluating and quantifying influences of the variables in the specified experimental domain. 2 identical factorial designs were applied to evaluate influence of the concentration of β-Lg and WPI, concentration of sorbitol and pH. The 2 materials, β-Lg and WPI, showed similar results, which can be attributed to the dominating **protein** β- **lactoglobulin**. At pH 9, Young's modulus and stress at break are not affected when the concentration of β-Lg, WPI or sorbitol varies. At pH 7 and 8, Young's modulus and stress at break increased when the concentration of β-Lg and WPI increased; values decreased when the concentration of sorbitol increased. Strain at break increases when pH increased from 7 to 9, a more pronounced effect being observed for the WPI films. Water vapour permeability (WVP) decreased and increased for pH 7 and 9, respectively, as the concentration of β-Lg and WPI increased. It is suggested that this contrast in behaviour at different pH values is probably due to a structural difference that occurs above pH 8. Moisture content and WVP increased when sorbitol concentration increased. A clear distinction was observed between the 2 film materials: the β-Lg films showed higher values for both moisture content and WVP measurements.
CC P (Milk and Dairy Products)
CT FILMS; LACTOGLOBULINS; PH; PHYSICAL PROPERTIES; PROTEINS MILK; **WHEY; Nb -LACTOGLOBULIN; WHEY PROTEINS**

L8 ANSWER 47 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1998(09):P1419 FSTA
TI Gel characteristics of β- **lactoglobulin, whey protein concentrate** and **whey protein isolate**.
AU Twomey, M.; Keogh, M. K.; Mehra, R.; O'Kennedy, B. T.
CS Nat. Dairy Products Res. Cent., Moorepark, Fermoy, Co. Cork, Republic of Ireland
SO Journal of Texture Studies, (1997), 28 (4) 387-403, 15 ref.
ISSN: 0022-4901
DT Journal
LA English
AB Gelation characteristics of β- **lactoglobulin, whey protein isolate** and **whey protein concentrate** at varying levels of **protein** (6-11%), sodium chloride (25-400mM), calcium chloride (10-40mM) and pH (4.0-8.0) were studied in a multifactorial design. Small scale deformation of the gels was measured by dynamic rheology to give the gel point (°C), complex consistency index (k*), complex power law factor (n*) and critical strain (γ.sub.c). The gel point decreased while turbidity increased with increasing Ca level. The denaturation temperature measured by DSC was reduced at higher pH values. Large scale deformation at 20 and 70% compression was measured using an Instron Universal Testing machine.

Protein level had the largest effect on the stress required to produce 20 and 70% compression and on the consistency (k*) of the gels.
CC P (Milk and Dairy Products)
CT GELATION; LACTOGLOBULINS; **PROTEIN CONCENTRATES; PROTEINS MILK; WHEY; Nb -LACTOGLOBULIN; WHEY PROTEIN CONCENTRATES; WHEY PROTEINS**

L8 ANSWER 48 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1998(07):P1207 FSTA
TI Gel formation from industrial **milk whey** proteins under hydrostatic pressure: effect of hydrostatic pressure and **protein** concentration.
AU Kanno, C.; Tai-Hau Mu; Hagiwara, T.; Ametani, M.; Azuma, N.
CS Dep. of Applied Biochem., Utsunomiya Univ., Utsunomiya 321, Japan. Tel. & Fax +81-28-649-5461. E-mail kanno(a)cc.utsunomiya-u.ac.jp
SO Journal of Agricultural and Food Chemistry, (1998), 46 (2) 417-424, 34 ref.
ISSN: 0021-8561
DT Journal
LA English
AB The effects of high hydrostatic pressure and **protein** concentration on the denaturation and gelation of **whey protein** were investigated. Industrial **whey protein isolate** (WPI) and **whey protein concentrate** (WPC) solutions (pH 6.8) at various concentration were pressurized for 10 min at 30°C under 200-1000 MPa. With the WPI solution, the concentration for affecting the turbidity was 1% and was 6% for the viscosity at 400 MPa, while for inducing gelation, it was 10% at 600 MPa. With the WPC solution, the viscosity changed at a concentration >12%, and gel formation began at >18% at 400 MPa. The hardness and breaking stress of pressure-induced WPI gels increased with increasing concentration of WPI (12-18%) and hydrostatic pressure, the ratings for the 20% WPC gels being one-third those of the 20% WPI gels. The solubility of proteins from the pressure-induced WPI gels decreased with increasing pressure, while that of WPC gel induced at >600 MPa remained constant at approx. 50%. The microstructure of the WPI gels had a porous network form, whereas the WPC gels were irregular particulates. β- **Lactoglobulin**, α- **lactalbumin** and serum albumin preferentially participated in pressure-induced aggregation and gelation through S-S bonding.
CC P (Milk and Dairy Products)
CT GELATION; PRESSURE; **PROTEINS MILK; WHEY; WHEY PROTEINS**

L8 ANSWER 49 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1998(07):P1202 FSTA
TI Aggregate formation during hydrolysis of β- **lactoglobulin** with a Glu and Asp specific protease from Bacillus licheniformis.
AU Otte, J.; Lomholt, S. B.; Ipsen, R.; Stapelfeldt, H.; Bukrinsky, J. T.; Qvist, K. B.
CS Dep. of Dairy & Food Sci., Royal Vet. & Agric. Univ., Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark. Tel. +45 35 28 31 89. Fax +45 35 28 31 90. E-mail jo(a)kvl.dk
SO Journal of Agricultural and Food Chemistry, (1997), 45 (12) 4889-4896, 18 ref.
ISSN: 0021-8561
DT Journal
LA English
AB The hydrolysis of isolated β- **lactoglobulin** (9 and 70-200 mg/ml) by a Bacillus licheniformis proteinase was followed to assess whether aggregates and gels, respectively, were formed during hydrolysis. Changes during hydrolysis were monitored by electrophoresis, dynamic light

scattering and fluorescence and circular dichroism spectroscopy. Gelation was monitored by dynamic oscillation rheology. Upon hydrolysis of a β- **lactoglobulin** preparation with the B. licheniformis proteinase aggregates were formed and a soft gel resulted from only 70 mg/ml of β- **lactoglobulin**. The aggregates consisted of a number of peptides with mol. weight ranging from 2000 to 6000 and pI from 5 to 8. As the aggregates were solubilized in either SDS or urea or at extreme pH values, it is proposed that noncovalent interactions, mainly electrostatic and hydrophobic, are major interacting forces. These kinds of aggregates are thought to be important in proteinase-induced gelation of **whey protein isolate** solutions.

CC P (Milk and Dairy Products)

CT AGGLOMERATION; BACILLUS; LACTOGLOBULINS; PROTEINASES; **Nb -LACTOGLOBULIN**; AGGREGATION; HYDROLYSIS

L8 ANSWER 50 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1998(06):P0975 FSTA

TI **Whey** to go.

AU Hoch, G. J.

SO Food Processing, USA, (1997), 58 (3) 51-52
ISSN: 0015-6523

DT Journal

LA English

AB Functional and nutritional properties of **whey protein** products are discussed. Aspects considered include: applications of **whey protein isolate** (WPI) and **whey protein concentrate** (WPC) in fortified beverages; application of WPI and WPC in foods requiring gelation, emulsification, acid stability, film formation and aeration; methods of WPC and WPI manufacture; health benefits of **whey** proteins; use of α- **lactalbumin**, β- **lactalbumin**, lactoferrin and immunoglobulins derived from **whey** proteins in foods including amino acid fortified foods; and novel applications for WPI with selectively altered gelation characteristics.

CC P (Milk and Dairy Products)

CT BEVERAGES; **PROTEIN CONCENTRATES**; **PROTEINS MILK**; **WHEY**; FOODS; **WHEY PROTEIN CONCENTRATES**; **WHEY PROTEINS**

L8 ANSWER 51 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1998(01):P0070 FSTA

TI Micro-scale method for determining foaming properties of **protein**.

AU Xiaolin L. Huang; Catignani, G. L.; Swaisgood, H. E.

CS Correspondence (Reprint) address, H. E. Swaisgood, Southeast Dairy Foods Res. Cent., North Carolina State Univ., Raleigh, NC 27695-7624, USA

SO Journal of Food Science, (1997), 62 (5) 1028-1030, 1060, 13 ref.
ISSN: 0022-1147

DT Journal

LA English

AB A 5% **protein** suspension (4 ml) was whipped in a modified 50-ml centrifuge tube using a tissumizer equipped with a flat-bottom generator. Drainage time at 50% liquid weight and the weight of the foam formed/unit volume were used for calculating foam stability and foam overrun, respectively. The foaming properties of a variety of **milk** proteins [**whey protein concentrate**, **whey protein isolate**, bovine serum albumin, β- **lactoglobulin** and sodium caseinate] were determined using this method. This method distinguished differences in foaming properties among the proteins. Values for overrun confirmed published results. Compared with standard methods, this method required much less sample (about 1/20) and less measuring time (about 1/5 to 1/10).

CC P (Milk and Dairy Products)
CT FUNCTIONAL PROPERTIES; **PROTEINS MILK**; FOAMING PROPERTIES; **MILK PROTEINS**

L8 ANSWER 52 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1997(10):P0217 FSTA
TI The effects of CaCl.sub.2 on aggregation of **whey** proteins.
AU Sherwin, C. P.; Foegeding, E. A.
CS Dep. of Food Sci. & Nutr., Univ. of Minnesota, St. Paul, MN 55108, USA
SO Milchwissenschaft, (1997), 52 (2) 93-96, 12 ref.
ISSN: 0026-3788
DT Journal
LA English
SL German
AB Aggregation rates of calcium-containing **whey protein isolate** (WPI) or β- **lactoglobulin** solutions were determined by measuring the rate of change in turbidity (O.D..sub.4.sub.0.sub.0). Aggregation at 40-70°C follwed zero order kinetics and did not fit a simple Arrhenius relationship, suggesting different mechanisms above and below denaturation temperature. The stoichiometry of CaCl.sub.2 and **protein** concentrations had a greater effect on aggregation at 40 and 50°C than calcium concentration. Maximum aggregation rates occurred when CaCl.sub.2 (mM)/ **protein** (%w/v) was between 3.3 and 23.3. Results suggest that aggregation occurring at sub-denaturation temperatures during **whey** processing may be controlled by altering the calcium to **protein** ratio.
CC P (Milk and Dairy Products)
CT AGGLOMERATION; CALCIUM; DAIRY PRODUCTS; LACTOGLOBULINS; MINERALS; PROTEINS; PROTEINS MILK; **WHEY**; **Nb -LACTOGLOBULIN**; AGGREGATION; CA; **WHEY PROTEINS**

L8 ANSWER 53 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1997(10):P0037 FSTA
TI Binding of retinoids to β- **lactoglobulin** isolated by bioselective adsorption.
AU Qiwu Wang; Allen, J. C.; Swaisgood, H. E.
CS S. E. Dairy Foods Res. Cent., Dep. of Food Sci., North Carolina State Univ., Raleigh, NC 27695-7624, USA
SO Journal of Dairy Science, (1997), 80 (6) 1047-1053, 26 ref.
ISSN: 0022-0302
DT Journal
LA English
AB Binding of the retinoids all-trans-retinol, all-trans-retinal, all-trans-retinyl acetate and all-trans-retinoic acid to β- **lactoglobulin** (LG; 96% purity; prepared by bioselective adsorption on N-retinyl-Celite®) was determined from changes in the fluorescence quenching (332 nm) of the **protein** tryptophanyl residues. High affinity binding of all of these compounds occurred at pH 7.0 and the apparent dissociation constant ranged from 1.7 to 3.6 x 10.sup.-.sup.8M. Furthermore, a stoichiometry of 1.0 mol/mol of **protein** was obtained for each case, indicating that all of the sites in the **protein** preparation were available. When β-LG in **whey protein isolate** (57.4% β-LG) was studied, a stoichiometry of 0.65-0.82 mol/mol of **protein** was obtained, indicating that a large number of the sites already had bound lipid or that the **protein** had been denatured. As the pH was lowered toward 5.15, the affinity decreased about 4x, but the stoichiometry of binding was unchanged. Far UV circular dichroism spectra indicated that secondary structure of the **protein** was not significantly affected by ligand binding; however, the near UV spectra were changed, indicating that the flexibility of tryptophanyl residues decreased. The latter effect is consistent with the change in fluorescence quenching and

suggests that a tryptophan is in the binding site. [It is concluded that β-LG obtained by bioselective adsorption has a high affinity and greater binding capacity for retinols than β-LG in **whey protein isolate**. See also following abstract]

CC P (Milk and Dairy Products)

CT LACTOGLOBULINS; PROTEINS; RETINOLS; VITAMINS; **Nb -LACTOGLOBULIN**; BINDING

L8 ANSWER 54 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(08):P0120 FSTA

TI Thermal stabilization of β- **lactoglobulin** by **whey** peptide fractions.

AU Barbeau, J.; Gauthier, S. F.; Pouliot, Y.

CS Correspondence (Reprint) address, S. F. Gauthier, Cent. de Recherche STELA, Fac. des Sci. de l'Agric. et de l'Alimentation, Univ. Laval, Quebec, Que. G1K 7P4, Canada. Tel. (418) 656-2682. Fax (418) 656-3353

SO Journal of Agricultural and Food Chemistry, (1996), 44 (12) 3939-3945, 62 ref.
ISSN: 0021-8561

DT Journal

LA English

AB Tryptic hydrolysate of **whey protein isolate** (WPI) was fractionated by anion-exchange chromatography (AEC) and hydrophobic interaction chromatography (HIC). Individual β-**lactoglobulin** (β-lg), a mixture of β-lg and nonfractionated hydrolysate, and β-lg:peptide mixtures (3:1 weight ratio) were solubilized in acetate or phosphate buffers, and their heat denaturation profiles between 25 and 100°C were studied over the pH range of 4.6-8.0. Thermal denaturation of individual β-lg was greatly influenced by pH, its denaturation temperature (T.sub.D) decreasing from 77.4 to 66.9°C for pH 4.6-8.0, respectively. The addition of nonfractionated hydrolysate to β-lg accentuated this effect, whereas T.sub.D and heat enthalpy (ΔH.sub.D) were increased in the presence of the peptide fractions. Fractions obtained by AEC (F.sub.2-F.sub.8) thermally stabilized β-lg as a function of their increasing ionic charge, and this effect became more important as the pH was raised from 4.6 to 8.0. The results obtained with HIC fractions (F.sub.A, F.sub.B, and F.sub.D) showed a T.sub.D of 78-80°C over the pH range under study. The binding of peptides to β-lg, possibly via ionic or hydrophobic interactions, may stabilize β-lg structure against heat treatment.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; LACTOGLOBULINS; PEPTIDES; PHYSICAL PROPERTIES; PROTEINS; PROTEINS MILK; THERMOPHYSICAL PROPERTIES; **WHEY**; **Nb -LACTOGLOBULIN**; THERMAL STABILITY; **WHEY PROTEINS**

L8 ANSWER 55 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(08):A0013 FSTA

TI Biopolymers produced by cross-linking soybean 11S globulin with **whey** proteins using transglutaminase.

AU Yildirim, M.; Hettiarachchy, N. S.

CS Correspondence (Reprint) address, N. S. Hettiarachchy, Dep. of Food Sci., Univ. of Arkansas, Fayetteville, AR 72704, USA

SO Journal of Food Science, (1997), 62 (2) 270-275, 36 ref.
ISSN: 0022-1147

DT Journal

LA English

AB Heterogeneity of biopolymers was determined by cross-linking acetylated-11S acidic subunits (AC-11S) of soy **protein** with α- **lactalbumin** and β- **lactoglobulin**. The extent of polymerization was determined by electrophoresis and HPLC. Differential scanning calorimetry (DSC) was used to determine thermal properties of starting proteins and biopolymers. HPLC data demonstrated the absence of biopolymers from AC-11S, acetylated α-

lactalbumin and acetylated β- **lactoglobulin** when each was incubated separately with transglutaminase (TG). However, AC-11S formed biopolymers with α- **lactalbumin** and β- **lactoglobulin** when TG was added. TG catalysed the formation of heterologous and homologous biopolymers from **whey protein isolate** (WPI) and soybean 11S globulin (11S). Cross-linking WPI and 11S provided biopolymers with improved heat stability which may be useful to provide functionality to food products.

CC A (Food Sciences)

CT DAIRY PRODUCTS; ENZYMES; PROTEINS; PROTEINS MILK; SOY PROTEINS; TRANSFERASES; VEGETABLE PRODUCTS; **WHEY**; SOY 11S GLOBULINS; TRANSGLUTAMINASES; **WHEY PROTEINS**

L8 ANSWER 56 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(07):P0018 FSTA

TI Enzymatic cross-linking of **whey** proteins by a Ca.sup.2.sup.+-independent microbial transglutaminase from Steptomyces lydicus.

AU Faergemand, M.; Otte, J.; Qvist, K. B.

CS Dep. of Dairy & Food Sci., Dairy Sect., Royal Vet. & Agric. Univ., DK-1958 Frederiksberg C, Denmark

SO Food Hydrocolloids, (1997), 11 (1) 19-25, 29 ref. ISSN: 0268-005X

DT Journal

LA English

AB In this study, a Ca.sup.2.sup.+-independent microbial transglutaminase derived from Streptomyces lydicus was used to cross-link **whey protein isolate** (WPI) and β- **lactoglobulin** . The course of the reaction was followed with size-exclusion (SE)-HPLC. In WPI solutions, no enzyme-catalysed decrease in monomeric/dimeric β- **lactoglobulin** was observed in the absence of a reductant, whereas a decrease in α- **lactalbumin** content and formation of higher molecular weight products was found without a reductant in the presence of transglutaminase. In the presence of the reductant dithiothreitol (DTT), both α- **lactalbumin** and β- **lactoglobulin** in WPI were extensively cross-linked by transglutaminase. Gelation was observed visually in the enzyme-treated WPI samples containing DTT at **protein** concentrations above 10% within 120 min using 10 U transglutaminase/g **whey protein**. Cross-linking of pure β- **lactoglobulin** in the presence of DTT was followed as a function of reaction time. With SE-HPLC, a decrease in β- **lactoglobulin** was monitored during 180 min of reaction at 40°C, after which the concentration of β- **lactoglobulin** monomers was reduced by 90%. The formation of covalently linked polymers was confirmed by gel electrophoresis (SDS-PAGE) under reducing conditions. The apparent viscosity of an 8% β- **lactoglobulin** solution incubated with transglutaminase increased with reaction time and after approx. 100 min of reaction gelation was evident, as indicated by a steep increase in apparent viscosity.

CC P (Milk and Dairy Products)

CT BACTERIA; DAIRY PRODUCTS; ENZYMES; MICROORGANISMS; PROTEINS; PROTEINS MILK; STREPTOMYCES; TRANSFERASES; **WHEY**; TRANSGLUTAMINASES; **WHEY PROTEINS**

L8 ANSWER 57 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(06):F0021 FSTA

TI Mass transfer properties of **whey protein** films and their effect on the rancidity process of dry nuts.

AU Mate, J. I.

CS Univ. of California, Davis, CA 95616, USA

SO Dissertation Abstracts International, B, (1996, thesis publ. 1995), 56 (11) 5860-5861 Order No. DA9608857, 125pp.

ISSN: 0419-4217
DT Dissertation
LA English
AB Properties and applications of **whey protein isolate** (WPI) based edible films were studied. Permeability properties of WPI films and films containing only the major **protein** fraction of **whey**, β- **lactoglobulin** (β-Lg), were compared. Application of WPI films as coatings for dry nuts to delay rancidity development was also investigated. Accelerated tests for rancidity (peroxide value and static headspace analysis) of blanched peanuts, blanched roasted peanuts and shelled walnuts were performed at high and low O.sub.2 content. A method was then developed to coat peanuts with **whey protein** aqueous solutions, based on increasing the coating solution viscosity. [From En summ.]
CC F (Packaging)
CT DAIRY PRODUCTS; FILMS; FRUITS; NUTS; PROTEINS; PROTEINS MILK; RANCIDITY; SEEDS; **WHEY**; **WHEY PROTEINS**

L8 ANSWER 58 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1997(04):F0009 FSTA
TI Comparison of oxygen and water vapor permeabilities of **whey protein isolate** and β- **lactoglobulin** edible films.
AU Mate, J. I.; Krochta, J. M.
CS Correspondence (Reprint) address, J. M. Krochta, Dep. of Food Sci. & Tech., Univ. of California at Davis, Davis, CA 95616, USA. Tel. (916) 752-2164. Fax (916) 752-4759. E-mail jmkrochta(a)ucdavis.edu
SO Journal of Agricultural and Food Chemistry, (1996), 44 (10) 3001-3004, 20 ref.
ISSN: 0021-8561
DT Journal
LA English
AB Oxygen permeability (OP) and water vapour permeability (WVP) of **whey protein isolate** (WPI) and β- **lactoglobulin** (β-Lg) edible films were studied at 3 different levels of glycerol content. WVP and OP of WPI films were not statistically different from WVP and OP of β-Lg films. Although the presence of glycerol as plasticizer could have masked some differences between β-Lg and WPI films, β-Lg appears to contribute to the barrier properties of the **protein** matrix of WPI in a manner similar to other **whey protein** fractions. Temperature had an exponential effect on the OP of WPI and β-Lg films. Results fitted the Arrhenius model with activation energies in the 10.5-13.5 kcal/mol range.
CC F (Packaging)
CT DAIRY PRODUCTS; FILMS; LACTOGLOBULINS; PERMEABILITY; PROTEINS; PROTEINS MILK; **WHEY**; **Nb -LACTOGLOBULIN**; **WHEY PROTEINS**

L8 ANSWER 59 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1997(02):P0004 FSTA
TI Oil-in-water emulsions stabilized by sodium caseinate or **whey protein isolate** as influenced by glycerol monostearate.
AU Euston, S. E.; Harjinder Singh; Munro, P. A.; Dalgleish, D. G.
CS Correspondence (Reprint) address, Harjinder Singh, Dep. of Food Tech., Massey Univ., Palmerston North, New Zealand
SO Journal of Food Science, (1996), 61 (5) 916-920, 25 ref.
ISSN: 0022-1147
DT Journal
LA English
AB Competitive adsorption between glycerol monostearate (GMS) and **whey protein isolate** (WPI) or sodium caseinate was studied in oil-in-water emulsions (20 weight% soybean oil, deionized water, pH 7). Addition of GMS resulted in partial displacement of WPI or sodium caseinate from the emulsion interface. SDS-PAGE showed that GMS

altered the adsorbed layer composition in sodium caseinate stabilized emulsions containing ≤1.0 weight% **protein**. Predominance of β-casein at the interface in the absence of surfactant was reduced in the presence of GMS. The distribution of α- **lactalbumin** and β- **lactoglobulin** between the aqueous bulk phase and the fat surface in emulsions stabilized with WPI was independent of the concentration of added **protein** or surfactant.

CC P (Milk and Dairy Products)

CT CASEINATES; DAIRY PRODUCTS; EMULSIFIERS; EMULSIONS; ESTERS; GLYCERIDES; LIPIDS; OILS; PROTEINS; PROTEINS MILK; SORPTION; WATER; **WHEY**; ADSORPTION; GLYCEROL MONOSTEARATE; **PROTEIN ISOLATES**

L8 ANSWER 60 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(02):G0049 FSTA

TI Characterization of polymers produced by cross-linking soybean 11S globulin with milk **whey** proteins using transglutaminase.

AU Yildirim, M.; Hettiarachchy, N. S.; Kalapathy, U.

CS United States of America, Institute of Food Technologists 1996 Annual Meeting; Dep. of Food Sci., Univ. of Arkansas, Fayetteville, AR 72704, USA

SO (1996), 1996 IFT annual meeting: book of abstracts, p. 120 ISSN 1082-1236 ISSN: 1082-1236

DT Conference

LA English

AB Synthesis and characterization of **protein** polymers formed by cross-linking of proteins with transglutaminase are described. The proteins used were purified soybean 11S globulin, crude **whey protein isolate** (WPI), and α- **lactalbumin** and β- **lactoglobulin** purified from WPI. Pairs of proteins were cross-linked at 37°C, pH 7.5 using 0.04 U of guinea pig transglutaminase/mg **protein**. Reaction mixtures were sampled at 30-240 min, and **protein** polymers were analysed by electrophoresis, DSC and HPLC. 11S globulin formed polymers with WPI and the 2 individual **whey** proteins. The polymers were stable up to 80°C, had better thermal stability than WPI and exhibited similar stability to that of 11S globulin. [From En summ. Further abstracts of presentations from this meeting are covered in electronic formats of the FSTA database and may be traced via the corporate authors (CA) field, under United States of America, Institute of Food Technologists [1996 Annual Meeting]. See also FSTA (1996) 28 11A2.]

CC G (Catering, Speciality and Multicomponent Foods)

CT DAIRY PRODUCTS; ENZYMES; POLYMERS; PROTEINS; PROTEINS MILK; SOY PROTEINS; TRANSFERASES; **WHEY**; TRANSGLUTAMINASES; **WHEY PROTEINS**

L8 ANSWER 61 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(01):P0007 FSTA

TI Effects of ionic strength on the solubility of **whey protein** products. A colloid chemical approach.

AU Wit, J. N. de; Kessel, T. van

CS DMV Int., Veghel, PO Box 13, 5460 Veghel, Netherlands

SO Food Hydrocolloids, (1996), 10 (2) 143-149, 28 ref. ISSN: 0268-005X

DT Journal

LA English

AB Solubility and native structure of **whey** proteins are important determinants for the functional properties of **whey protein** products. **Whey protein** denaturation is related to **protein** solubility at pH 4.6; a value which is approx. 0.5 pH unit below the iso-ionic points of the main **whey** proteins. Part of the native globulin-like **whey** proteins (mainly β- **lactoglobulin**) may also precipitate at pH 4.6, depending on ionic strength (salting-in effect) and salt composition. In order to distinguish **protein** denaturation from salting-in efects at pH

4.6, recent information on the 3-dimensional structure of β-**lactoglobulin**-A was combined with a quantitative description of the electrostatic interactions of β- **lactoglobulin**-A as a dipolar ion in media of low ionic strength. Comparison of these results with the experimentally determined solubility data at pH 4.6 revealed significant differences in the pH of min. solubility between **whey** potein concentrates (from membrane processes) and **whey protein** isolates (from ionic exchange processes). A **whey protein isolate** obtained by ionic exchange processing showed min. solubility near the iso-electric point of β-**lactoglobulin**-A (pH 5.2). **Whey protein** concentrates having ≥80% **protein** in TS showed min. solubility in the pH range 4.6-5.0. It is concluded that adjustment of ionic strength to 0.1, using, for example, NaCl, may prevent insolubilization of globulin-like proteins between pH 4.5 and 5.5. When **protein** solubility tests at pH 4.6 are used for the characterization of **whey protein** denaturation, it is recommended that media having an ionic strength of 0.1 is used for all **whey protein** products. [From En summ.]

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; PHYSICAL PROPERTIES; PROTEINS; PROTEINS MILK; SOLUBILITY; **WHEY**; IONIC STRENGTH; **WHEY PROTEINS**

L8 ANSWER 62 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1997(01):A0046 FSTA

TI The effect of the presence of KCl on the adsorption behaviour of **whey protein** and caseinate in oil-in-water emulsions.

AU Hunt, J. A.; Dalgleish, D. G.

CS Correspondence (Reprint) address, D. G. Dalgleish, Dep. of Food Sci., Univ. of Guelph, Guelph, Ont. N1G 2W1, Canada

SO Food Hydrocolloids, (1996), 10 (2) 159-165, 15 ref.
ISSN: 0268-005X

DT Journal

LA English

AB [Effect of the presence of a neutral salt (KCl) on adsorption of proteins in emulsions made with either **whey protein isolate** (WPI) or caseinate was investigated.] Emulsions were prepared containing 20% soy oil and 2% **protein**, which was either caseinate or WPI. At pH 7, oil droplets in emulsions made using WPI showed small increases in diameter with increasing concentration of KCl in the range 0-200mM, but at pH 3 concentration of KCl >50 mmol/dm.sup.3 caused very large increases in the diameter of the particles, and the emulsions appeared viscous; this effect of KCl was not reversed by dilution. In emulsions prepared with mixtures of proteins, the proportions of proteins adsorbing from WPI and caseinate were affected by the presence of KCl. This was reflected also in the composition of adsorbed **protein** on emulsion droplets made originally with WPI, and subsequently resuspended in caseinate. In these resuspended emulsions all of the α-**lactalbumin** was displaced by caseins, and the amount of β-**lactoglobulin** displaced depended on the age of the WPI emulsion when caseinate was introduced. The thickness of the adsorbed layer depended on: the type of **protein** that was used to make the emulsion; whether more **protein** was added after homogenization; and the age of the emulsion when further **protein** was added. This behaviour reflected different structures of the adsorbed layer.

CC A (Food Sciences)

CT CASEINATES; CHLORIDES; EMULSIONS; PROTEINS; PROTEINS MILK; SALTS; SORPTION; **WHEY**; ADSORPTION; KCL; **WHEY PROTEINS**

L8 ANSWER 63 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1996(09):P0001 FSTA

TI Studies on the electrostatic interactions of lysozyme with α-

lactalbumin and β- **lactoglobulin**.

AU Howell, N. K.; Yeboah, N. A.; Lewis, D. F. V.

CS Sch. of Biol. Sci., Univ. of Surrey, Guildford GU2 5XH, UK. Fax +44 1483 576978

SO International Journal of Food Science & Technology, (1995), 30 (6) 813-824, 23 ref.

DT Journal

LA English

AB Effects of mixing lysozyme with a range of proteins (bovine serum albumin, β- **lactoglobulin**, α- **lactalbumin**, sodium caseinate and **whey protein isolate**) were tested by turbidity measurements. Turbidity increased when proteins were mixed with lysozyme in water, but not in phosphate buffer with the exception of **whey protein isolate** and sodium caseinate, which showed turbidity (but not precipitation) when mixed with lysozyme in phosphate buffer. Studies on interactions of α- **lactalbumin** and β- **lactoglobulin** with lysozyme in aqueous solution (pH 6.8) using fast **protein** liquid chromatography (FPLC) showed that a higher level of interaction occurred between lysozyme and β- **lactoglobulin** than between lysozyme and α- **lactalbumin**. A similar interaction was not observed between α- **lactalbumin** and β- **lactoglobulin**. The predominant product of the interaction was an insoluble precipitate; a small amount of soluble complex was also recovered by ion-exchange chromatography of the supernatant. The soluble complex was shown by SDS-PAGE to comprise the same components as the insoluble precipitate, i.e. lysozyme and α- **lactalbumin** or β- **lactoglobulin**. Interactions of proteins and amount of precipitation varied with concentration of each **protein**, ionic strength and pH of the solution. Molecular modelling studies, using interactive docking of crystal structures, indicated that for the β- **lactoglobulin**-lysozyme interaction the optimum visual fit could involve electrostatic interactions between Glu35 and Asp53 in the catalytic binding site of lysozyme and Lys138 and Lys141 at the dimerization site of β- **lactoglobulin**. For α- **lactalbumin**-lysozyme mixtures, however, modelling suggested that non-specific electrostatic binding may occur. [From En summ.]

CC P (Milk and Dairy Products)

CT ENZYMES; LYSOZYMES; PROTEINS; PROTEINS MILK; MILK PROTEINS

L8 ANSWER 64 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1996(08):P0130 FSTA

TI Studies on available utilization of **whey** proteins. IV. Effect of preheating at high temperature under vacuum on physical properties of heat-induced **whey protein isolate** gels.

AU Fujino, H.; Muguruma, M.; Ogata, T.; Ito, T.; Ohashi, T.

CS Higashi Chikushi Coll., 5-1-1 Shimoitozu, Kokurakita-ku, Kitakyushu 803, Japan

SO Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi], (1995), 42 (10) 762-768, 13 ref. ISSN: 0029-0394

DT Journal

LA Japanese

SL English

AB Effect of preheating at high temperature under vacuum on physical properties of heat induced **whey protein isolate** (WPI) gels was investigated. Preheated WPI (120°C, 1 h) heated at 70°C produced weak gels. Strong gels with high elastic modulus were prepared from preheated WPI heated at 90 or 100°C. Transition of flow behaviour of preheated WPI solution from rheopexy to thixotropy suggested that a precursor of gelation and a reduction in activation energy required for gelation occurred in preheated WPI. HPLC analysis revealed changes in molecular shape and surface charges of proteins associated with

conformational changes in preheated WPI. β- **Lactoglobulin** structure was markedly influenced by preheating of WPI. [From En summ. See preceding abstract for part III and following abstract for part V.]

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; GELS; HEATING; PHYSICAL PROPERTIES; PROCESSING THERMAL; PROTEINS; PROTEINS MILK; **WHEY**; **WHEY PROTEINS**

L8 ANSWER 65 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1996(08):P0129 FSTA

TI Studies on available utilization of **whey** proteins. III. Effect of preheating at high temperature under vacuum on heat aggregation of **whey protein isolate**.

AU Fujino, H.; Muguruma, M.; Mori, K.; Tsueno, D.; Sasaki, A.; Ito, T.; Ohashi, T.

CS Higashi Chikushi Coll., 5-1-1 Shimoitozu, Kokurakita-ku, kitakyushu 803, Japan

SO Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi], (1995), 42 (10) 756-761, 13 ref.
ISSN: 0029-0394

DT Journal

LA Japanese

SL English

AB Effect of preheating at high temperature under vacuum on heat aggregation of **whey protein isolate** (WPI) was investigated. A time course of turbidity was measured by heating at 2°C/min from 30 to 95°C. Turbidity of a control WPI solution at pH 6.0 increased beyond 53°C, whereas turbidity of preheated (120°C, 1 h) WPI increased beyond 50°C. Peak temperature of preheated WPI decreased from 65 to 57°C. SDS-PAGE revealed that new high mol. weight compounds were formed after preheating at 120°C for 3 h, and that β- **lactoglobulin** was more sensitive to preheating than α- **lactalbumin**. DSC was used to examine thermal behaviour of preheated WPI solutions. The peak temperature of maximum heat absorption of WPI shifted from 72.5 to 74.2°C after preheating at 120°C for 1 h. Denaturation enthalpies for preheated WPI were 50% lower than those for the control. Results revealed conformational changes in **whey** proteins caused by preheating. The presence of 200mM NaCl increased turbidity of WPI solution and preheated WPI beyond 73 and 60°C, respectively. Addition of 5mM CaCl.sub.2 to WPI solutions containing 200mM NaCl lowered the aggregation temperature It is concluded that desirable coagulation of preheated WPI can be achieved by addition of NaCl and CaCl.sub.2. [From En summ. See following 2 abstract for parts IV and V.]

CC P (Milk and Dairy Products)

CT AGGLOMERATION; DAIRY PRODUCTS; HEATING; PROCESSING THERMAL; PROTEINS; PROTEINS MILK; **WHEY**; AGGREGATION; **WHEY PROTEINS**

L8 ANSWER 66 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1996(05):P0215 FSTA

TI Kinetics of thermal denaturation of β- **lactoglobulin** (β-Lg) as determined by fast **protein** liquid chromatography (FPLC).

AU Jaskulka, F. J.; Smith, D. E.

CS United States of America, American Dairy Science Association Joint Meeting 1995; United States of America, Northeast ADSA/ASAS Joint Meeting 1995; Univ. of Minnesota, St. Paul, MN 55108, USA

SO Journal of Dairy Science, (1995), 78 (Suppl. 1) 131
ISSN: 0022-0302

DT Conference

LA English

AB Thermal denaturation of β- **lactoglobulin** (BL), defined as loss of solubility at pH 4.6, was measured by anion-exchange chromatography. A commercial BL-enriched **whey protein isolate** was concentrated (acidification/heating) to remove other

whey proteins. **Protein** solutions were buffered to pH 7, and heated to 70, 80 or 90°C for 0-31.5 min, to produce irreversible denaturation and aggregation of BL. Kinetics of the reaction were determined. [From En summ. Further abstracts from this Meeting may be traced via the corporate authors (CA) field, under United States of America, American Dairy Science Association [Joint Meeting 1995] and United States of America, Northeast ADSA/ASAS [Joint Meeting 1995]. See also FSTA (1996) 28 4P27.]

CC P (Milk and Dairy Products)

CT DENATURATION; HEATING; LACTOGLOBULINS; PROCESSING THERMAL; PROTEINS; **Nb -LACTOGLOBULIN**; KINETICS

L8 ANSWER 67 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1995(03):P0111 FSTA

TI β- **Lactoglobulin** separation from **whey protein isolate** on a large scale.

AU Mate, J. I.; Krochta, J. M.

CS Correspondence (Reprint) address, J. M. Krochta, Dep. of Food Sci. & Tech., Univ. of California, Davis, CA 95616, USA

SO Journal of Food Science, (1994), 59 (5) 1111-1114, 21 ref.
ISSN: 0022-1147

DT Journal

LA English

AB A method for obtaining large quantities of β- **lactoglobulin** (β-Lg) from commercial **whey protein isolate** (WPI) was developed. β-Lg was separated from the rest of the **whey** proteins in a solution of 15% (w/w) WPI in distilled water adjusted to pH 2 and 7% NaCl. β-Lg was then separated from NaCl using diafiltration. Results showed that >65% of the β-Lg originally in the WPI solution was recovered. Purity of the β-Lg was >95%.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; EXTRACTION; LACTOGLOBULINS; PROCESSING; PROTEINS; PROTEINS MILK; **WHEY**; **Nb -LACTOGLOBULIN**; **PROTEIN ISOLATES**

L8 ANSWER 68 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1995(02):P0010 FSTA

TI Effect of pH on the stability and surface composition of emulsions made with **whey protein isolate**.

AU Hunt, J. A.; Dalgleish, D. G.

CS Correspondence (Reprint) address, D. G. Dalgleish, Dep. of Food Sci., Univ. of Guelph, Guelph, Ont. N1G 2W1, Canada

SO Journal of Agricultural and Food Chemistry, (1994), 42 (10) 2131-2135, 17 ref.
ISSN: 0021-8561

DT Journal

LA English

AB [Effects of pH on stability of **whey protein isolate** (WPI) emulsions were investigated.] Emulsions (20 weight% soy oil) made with various concentration (0.5-2.5 weight%) of WPI were most stable at pH 7 and least stable at pH 5.5. Emulsions made with imidazole buffer at pH 6 were stable, but those made with citrate buffer at the same pH were unstable. Emulsions prepared at pH 3, using citrate buffer, were stable. At pH 7, β- **lactoglobulin** and α- **lactalbumin** adsorbed in proportion to their concentration, but at lower pH values α- **lactalbumin** adsorbed preferentially, depending on the **protein** concentration, pH, and buffer. When emulsions (2 weight% WPI) were acidified from pH 7 to 3 more α- **lactalbumin** adsorbed and the emulsion was stable but reducing pH from 7 to 6 did not alter the inferfacial composition of **protein** and the emulsion became unstable. Results suggest that the behaviour of **whey** proteins

depends on variations of tertiary and quaternary structure with pH.
CC P (Milk and Dairy Products)
CT DAIRY PRODUCTS; EMULSIONS; PH; PHYSICAL PROPERTIES; PROTEINS; PROTEINS MILK; STABILITY; **WHEY**; **WHEY PROTEINS**

L8 ANSWER 69 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1995(02):A0055 FSTA
TI Oscillatory rheological comparison of the gelling characteristics of egg white, **whey protein** concentrates, **whey protein isolate**, and β- **lactoglobulin**.
AU Qingnong Tang; McCarthy, O. J.; Munro, P. A.
CS Correspondence (Reprint) address, P. A. Munro, Dep. of Food Tech., Massey Univ., Palmerston North, New Zealand
SO Journal of Agricultural and Food Chemistry, (1994), 42 (10) 2126-2130, 19 ref.
ISSN: 0021-8561
DT Journal
LA English
AB A Bohlin rheometer was used in the oscillatory mode to compare the gelation characteristics of egg white, 2 commercially available **whey protein** concentrates, a commercially available **whey protein isolate**, and β-**lactoglobulin**. At **protein** concentration ≤20%, egg white had a lower gelation temperature, a higher initial gelation rate, and a higher gel stiffness (G') than the other **protein** preparations; at **protein** concentration ≤16%, egg white had a higher value of the ratio G'(80°C)/G'(20°C) than the 3 commercial **whey protein** products. Egg white had a much lower min. **protein** concentration for gelation. **Whey protein concentrate** and **isolate** preparations with increased salt contents could match egg white in terms of G' and could almost match egg white in terms of initial gelation rate. All cations tested increased G' of **whey protein isolate** gels in the order Mg.sup.2.sup.+ > Fe.sup.3.sup.+ > Ca.sup.2.sup.+ > K.sup.+ > Na.sup.+. [From En summ.]
CC A (Food Sciences)
CT DAIRY PRODUCTS; EGG WHITES; GELATION; LACTOGLOBULINS; PROTEINS; **PROTEINS MILK**; **WHEY**; **Nb -LACTOGLOBULIN**; **WHEY PROTEINS**

L8 ANSWER 70 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1995(01):P0115 FSTA
TI Effect of heat treatments in very acidic conditions on **whey protein isolate** properties.
AU Lupano, C. E.
CS Cent. de Investigacion y Desarrollo en Criotecnologia de Alimentos, Fac. de Ciencias Exactas, Univ. Nacional de La Plata, 1900 La Plata, Argentina. Fax 54 21 254853
SO Journal of Dairy Science, (1994), 77 (8) 2191-2198, 25 ref.
ISSN: 0022-0302
DT Journal
LA English
AB A **whey protein isolate** was dispersed in 0.1M HCl (1.2-1.3 pH) and heated at 90°C for up to 120 min. After cooling, pH was adjusted to 6.9, and samples were dialysed against distilled water at 3°C then freeze-dried. Changes occurring, e.g. denaturation and deamidation of **whey** proteins, and alterations in their solubility and gelling properties, were monitored. **Protein** denaturation, observed by DSC, was associated with a loss of solubility near the isoelectric point and at higher heat treatments. The extent of an observed partial deamidation increased linearly with heating time, reaching 11% after 2 h heating. Solubility curves indicated that differences between isoelectric points were not significant before and after deamidation. Electrophoretic patterns (SDS-PAGE) showed a

reduction in levels of β- **lactoglobulin**, α-**lactalbumin** and bovine serum albumin, with a corresponding appearance of proteins of low molecular mass and various aggregates. Gels prepared from maximally heated freeze-dried isolates at neutral pH had very low elasticities, firmness and water-holding capacity, although gels prepared from **protein** isolates heated for 0-60 min did not differ in texture characteristics despite **protein** changes.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; HEATING; PROCESSING THERMAL; PROTEINS; PROTEINS MILK; **WHEY**; **PROTEIN ISOLATES**

L8 ANSWER 71 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1994(12):P0011 FSTA

TI Heat-induced gel formation of β- **lactoglobulin**: a study on the secondary and tertiary structure as followed by circular dichroism spectroscopy.

AU Matsuura, J. E.; Manning, M. C.

CS Correspondence (Reprint) address, M. C. Manning, Dep. of Pharmaceutical Sci., Sch. of Pharmacy, Univ. of Colorado Health Sci. Cent., Denver, CO 80262, USA

SO Journal of Agricultural and Food Chemistry, (1994), 42 (8) 1650-1656, 34 ref.
ISSN: 0021-8561

DT Journal

LA English

AB Gelation properties of **whey protein isolate** (WPI) were investigated using purified β- **lactoglobulin** (β-LG) as a model for WPI. Changes in secondary and tertiary structure of β-LG during gel formation were studied by circular dichroism (CD) spectroscopy. Use of very short path length quartz cells (as low as 0.01 mm) allowed the in situ observation of gel formation. Salt concentration (0-1000mM) and pH (2.75-6.4) did not affect the secondary structure composition, either before or after heating, and no unfolded structure was detected during gel formation. However, an increase in residual tertiary structure was observed at higher salt concentration after heating. The use of dithiothreitol to prevent disulphide bond formation significantly increased the β-sheet content of β-LG gels. Analysis of CD spectra indicated that the secondary and tertiary structure of β-LG are dependent on **protein** concentration, both before and after heating. [From En summ.]

CC P (Milk and Dairy Products)

CT GELATION; LACTOGLOBULINS; PROTEINS; **Nb -LACTOGLOBULIN**; STRUCTURE

L8 ANSWER 72 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1994(06):P0124 FSTA

TI Effect of pH during heat processing of partially hydrolyzed **whey protein**.

AU Britten, M.; Giroux, H. J.; Gaudin, V.

CS Food Res. & Dev. Cent., Agric. Canada, 3600 Casavant Boulevard West, St.-Hyacinthe, Que. J2S 8E3, Canada

SO Journal of Dairy Science, (1994), 77 (3) 676-684, 35 ref.
ISSN: 0022-0302

DT Journal

LA English

AB **Whey protein isolate** was hydrolysed (degree of hydrolysis (DH) ≤5.1%) with Rhozyme® P-41 (a broad spectrum proteinase from Aspergillus oryzae supplied by Genecor, San Francisco, USA). The hydrolysed **whey protein isolate** was heated (75 ± 2°C for 15 min) at pH 4, 6 or 8. At DH of 5.1%, 50% of β- **lactoglobulin** was hydrolysed. α-**Lactalbumin** and bovine serum albumin were not hydrolysed by the

proteinase. Heating of the hydrolysate was associated with the formation of large and small aggregates. At pH 4.0 and 6.0, the proportion of small aggregates increased with increasing DH. The proportion of small aggregates at pH 8.0 was higher than at other pH. A low DH (1.7%) increased the proportion of large aggregates for all 3 pH values. The decrease in total sulphydryl groups with increasing DH and heating pH was associated with the formation of disulphide bonds. Heating the hydrolysate at pH 6 was associated with a significant reduction in hydrolysate solubility at neutral pH. When heating pH was adjusted to 4 or 8, average hydrolysate solubility at neutral pH was 98%. Solubility of the hydrolysates at pH 4.5 was lower than that at neutral pH. The hydrolysate heated at pH 4.0 had the highest solubility at pH 4.5. Solubility at pH 4.5 of the hydrolysate heated at pH 8.0 increased with increasing DH. Results are discussed in relation to the interactions between proteins and peptides during heating.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; HEATING; PH; PHYSICAL PROPERTIES; PROCESSING THERMAL; PROTEINS; PROTEINS MILK; **WHEY**; **PROTEIN HYDROLYSATES**

L8 ANSWER 73 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1994(03):P0016 FSTA

TI Polymerization of **whey** proteins in **whey protein**-stabilized emulsions.

AU Monahan, F. J.; McClements, D. J.; Kinsella, J. E.

CS Dep. of Food Sci. & Tech., Univ. of California, Davis, CA 95616, USA

SO Journal of Agricultural and Food Chemistry, (1993), 41 (11) 1826-1829, 20 ref.
ISSN: 0021-8561

DT Journal

LA English

AB Effects of emulsion storage time on polymerization, and the relative contributions of individual **whey** proteins to polymerization at the oil-water interface of a **whey protein isolate** (WPI, >97% **protein**) stabilized emulsion, were studied. Oil-in-water emulsions (21.7 weight% n-hexadecane in 0.05M phosphate buffer, pH 7.01, containing 1 weight% WPI) were prepared by blending and high pressure homogenization, and were diluted with either buffer alone or buffer with sufficient sulphydryl group blocking agent (N-ethylmaleimide, NEM) to give 0, 0.1, 0.25 or 0.50mM NEM in the aqueous phase. SDS-PAGE of emulsions stored at 20°C for up to 7 days showed that selective adsorption of β- **lactoglobulin** (β-Lg) and α- **lactalbumin** (α-La) over bovine serum albumin and immunoglobulins occurred at the oil-water interface of emulsions stabilized with WPI. High mol. weight **protein** polymers were progressively formed at the oil-water interface with increasing time following emulsion preparation. Formation of the high mol. weight **protein** polymers correlated with disappearance of β-Lg ($r = -0.98$) and α-La ($r = -0.97$) over the 7-day storage period. β-Lg concentration decreased from 50.7% of total **whey** proteins adsorbed at the interface immediately after emulsion preparation, to 24.6% after 24 h, and α-La decreased from 14.7% initially to 10.3% after 24 h. Polymerization involved the formation of intermolecular disulphide crosslinks between the monomeric proteins. [From En summ.]

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; EMULSIONS; OILS; PROTEINS; PROTEINS MILK; STORAGE; WATER; **WHEY**; POLYMERIZATION; **WHEY PROTEINS**

L8 ANSWER 74 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1993(10):P0055 FSTA

TI [The effect of α- **lactalbumin** and β- **lactoglobulin** on texturization of rennet casein.]

AU Ido, K.; Inoue, S.; Takano, K.; Nishiya, T.; Tatsumi, K.; Kamoi, I.

CS Tech. Res. Inst., Snow Brand Milk Products Co., 1-1-2, Minamidai, Kawagoe,

Saitama 350, Japan
SO Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi], (1993), 40 (4) 272-274, 8 ref.
ISSN: 0029-0394
DT Journal
LA Japanese
SL English
AB Effect of addition of 5% (dry weight basis) α- **lactalbumin** or β- **lactoglobulin** fractionated from **whey protein isolate** (WPI) on texture of rennet casein was investigated. Surface hydrophobicity of each casein product was determined using 1-anilino-8-naphthalene-sulphonate and hydrophobic gel chromatography. Addition of β- **lactoglobulin** decreased hydrophobicity of rennet casein, addition of α- **lactalbumin** did not. It is suggested that the decreased hydrophobicity following addition of β- **lactoglobulin** was due to formation of β- **lactoglobulin**-casein complexes during cooking. Fibrous texture of the rennet casein with added β- **lactoglobulin** was superior to that with added α- **lactalbumin**. It was concluded that β- **lactoglobulin** present in WPI played a major role in promoting fibrous texture in the rennet casein. [See also preceding abstract]. [From En summ.]
CC P (Milk and Dairy Products)
CT CASEIN; DAIRY PRODUCTS; PROTEINS; PROTEINS MILK; SENSORY PROPERTIES; TEXTURE; **WHEY**; **PROTEIN ISOLATES**

L8 ANSWER 75 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1993(08):Q0017 FSTA
TI Gel point of **whey** and egg **protein** using dynamic rheological data.
AU Yin Liang Hsieh; Regenstein, J. M.; Anandha Rao, M.
CS Correspondence (Reprint) address, J. M. Regenstein, Inst. of Food Sci., Cornell Univ., Ithaca, NY 14853-5601, USA
SO Journal of Food Science, (1993), 58 (1) 116-119, 38 ref.
ISSN: 0022-1147
DT Journal
LA English
AB The gel point temperature of coagulation type **protein** and gelation type proteins were determined by extrapolating the rapidly rising phase of the storage modulus G' back to the temperature axis. Gelation onset temperature of the concentration-independent proteins ovalbumin, ovotransferrin and BSA were 81, 62 and 75°C, respectively. Gelation of **whey protein isolate** and egg white gels, both concentration-dependent, was presumably due to disulphide bonds formed by the interactions of the concentration-independent proteins: α- **lactalbumin** and β- **lactoglobulin**, and ovalbumin and ovotransferrin, respectively. The incipient gel temperature of **whey** proteins decreased when the concentration of **whey** proteins increased.
CC Q (Eggs and Egg Products)
CT DAIRY PRODUCTS; EGG WHITES; GELATION; PROTEINS; PROTEINS ANIMAL; PROTEINS MILK; TEMPERATURE; **WHEY**; TEMP.; **WHEY PROTEINS**

L8 ANSWER 76 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1993(08):A0066 FSTA
TI A micro-scale method for measuring the hardness of heat-induced **protein** gels.
AU Lee, S. P.; Batt, C. A.
CS Correspondence (Reprint) address, C. A. Batt, Dep. of Food Sci., Cornell Univ., Ithaca, NY 14853, USA
SO Journal of Texture Studies, (1993), 24 (1) 73-79, 11 ref.
ISSN: 0022-4901

DT Journal
LA English
AB A micro-scale penetrometry method for testing hardness of heat-induced **whey protein** gels was developed. Hardness of gels could be determined quantitatively on sample volume as small as 20 μl. A needle with an outside diameter of 1.06 mm (18 gauge) weighted with a water reservoir was used to measure the force which was necessary to penetrate a gel contained within a capillary tube. In parallel, an Instron Universal Testing Machine was used for compression testing of **protein** gels. There was a high correlation between the values obtained using an Instron (70% compression) and those obtained using a micro-penetrometer for bovine β- **lactoglobulin** gels prepared at concentration in the range 10-13%. There was a high degree of correlation for hardness measurements between methods for gels made from either **whey protein isolate** or bovine serum albumin. Based upon standard curves of Instron force vs. penetration force, the penetration force of **whey protein** gels as measured by micro-scale penetrometry could be converted into relative Instron force units.
CC A (Food Sciences)
CT ANALYTICAL TECHNIQUES; DAIRY PRODUCTS; GELS; MECHANICAL PROPERTIES; PHYSICAL PROPERTIES; PROTEINS; PROTEINS MILK; SALTS; **WHEY**; HARDNESS; PENETROMETRY

L8 ANSWER 77 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1992(09):P0093 FSTA
TI Microcoagulation of a **whey protein isolate** by extrusion cooking at acid pH.
AU Queguiner, C.; Dumay, E.; Salou-Cavalier, C.; Cheftel, J. C.
CS Lab. de Biochimie et Tech. Alimentaires, Cent. de Genie Biol. et Sci. des Aliments, Univ. Montpellier II (Sci. et Tech.), 34095 Montpellier, France
SO Journal of Food Science, (1992), 57 (3) 610-616, 23 ref.
ISSN: 0022-1147
DT Journal
LA English
AB A **whey protein isolate** (WPI) was coagulated by thermomechanical processing in a twin screw extruder. Nonaggregated semi-solid spreads were obtained only in the pH range 3.5-3.9, at approx. 20% **protein** (77% water), a barrel temperature of 90-100°C and a screw speed of 100-200 rev/min. WPI extrusion-coagulated at pH 3.9 displayed a high nitrogen solubility (NSI) (43-47%). Electrophoresis indicated that the β- **lactoglobulin** constituent was entirely soluble in 1% SDS, while scanning calorimetry revealed about 82% **protein** unfolding. WPI extrusion-coagulated at pH 4.5-6.8 displayed lower NSI (25%), were less soluble in 1% SDS, were 88% unfolded and had grainy texture. Light microscopy, centrifugation in glycerol solutions, and laser diffractometry indicated the acid spread (pH 3.9) was composed of small coagulated particles, mean diameter 11.5 μm (volume basis).
CC P (Milk and Dairy Products)
CT COAGULATION; DAIRY PRODUCTS; EXTRUSION; PROTEINS MILK; **WHEY**; **WHEY PROTEINS**

L8 ANSWER 78 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1992(04):P0112 FSTA
TI Trends in the production & utilisation of dairy **protein** products: production.
AU Mulvihill, D. M.
CS Food Chem. Dep., Univ. Coll., Cork, Ireland
SO CSIRO Food Research Quarterly, (1991), 51 (3/4) 145-157, 16 ref.
ISSN: 0310-9070
DT Journal
LA English
AB The manufacture of **milk protein** products is described

with reference to the following aspects: production of caseins and caseinates; miscellaneous methods of casein and co-precipitate isolation; industrial scale fractionation of caseins; production of **whey protein**-enriched products including **whey** powder, **whey protein concentrate**, **whey protein isolate**, and **lactalbumin**; casein-**whey** co-precipitate production; and **milk protein concentrate** production.

CC P (Milk and Dairy Products)

CT **PROTEINS MILK; MILK PROTEINS**

L8 ANSWER 79 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1991(10):P0151 FSTA

TI Changes in gelling behavior of **whey protein isolate** and β- **lactoglobulin** during storage: possible mechanism(s).

AU Rector, D.; Matsudomi, N.; Kinsella, J. E.

CS Inst. of Food Sci., Cornell Univ., Ithaca, NY 14953, USA

SO Journal of Food Science, (1991), 56 (3) 782-788, 30 ref.
ISSN: 0022-1147

DT Journal

LA English

AB Dry-heat treatment of a dialysed **whey protein isolate** at 80°C for 7 days resulted in a decrease in hardness (from 1.55N to 0.49N) of gels formed from a 12% solution. Partial denaturation and progressive polymerization of **protein** was observed. Monomeric β- **lactoglobulin** concentration of the **whey** decreased from 60.64 to 33.33% after 7 days at 80°C. Rate constants determined at 40-80°C were used to calculate an Arrhenius relationship for the polymerization. After 1 yr at 25°C, 18% of monomeric β- **lactoglobulin** was projected to be converted to higher-mol.-weight material. Polymerization apparently did not involve disulphide cross-links.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; GELS; GLOBULINS; LACTOGLOBULINS; PROTEINS; STORAGE; **WHEY; Nb -LACTOGLOBULIN**

L8 ANSWER 80 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1991(07):P0009 FSTA

TI Mechanism of urea-induced **whey protein** gelation.

AU Xiong, Y. L.; Kinsella, J. E.

CS Correspondence (Reprint) address, J. E. Kinsella, Inst. of Food Sci., Cornell Univ., Ithaca, NY 14853, USA

SO Journal of Agricultural and Food Chemistry, (1990), 38 (10) 1887-1891, 21 ref.
ISSN: 0021-8561

DT Journal

LA English

AB **Whey protein isolate** (WPI) at 11.0% concentration spontaneously formed a gel at 25°C in 6M urea. As the pH was increased from 7 to 10, gel formation, from a viscous sol to an elastic network, was accelerated. Addition of N-ethylmaleimide up to 6mM inhibited gelation. The sulphydryl (SH) content of WPI decreased during urea incubation, especially with increasing pH. Electrophoretic analyses revealed the progressive disappearance of α- **lactalbumin**, β- **lactoglobulin**, and serum albumin during the gelation process with concomitant formation of polymers of these proteins. The spontaneous formation of gels in 6M urea resulted from **protein-protein** cross-linkages via oxidation of thiol groups and SH-disulphide interchange reactions.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; GELATION; PROTEINS; PROTEINS MILK; UREA; **WHEY; PROTEIN ISOLATES**

L8 ANSWER 81 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1990(11):G0007 FSTA
TI pH and heat treatment effects on foaming of **whey protein isolate**.
AU Phillips, L. G.; Schulman, W.; Kinsella, J. E.
CS Inst. of Food Sci., Stocking Hall, Cornell Univ., Ithaca, NY 14853, USA
SO Journal of Food Science, (1990), 55 (4) 1116-1119, 25 ref.
ISSN: 0022-1147
DT Journal
LA English
AB The overrun obtained by whipping **whey protein isolate** (WPI) was significantly ($P < 0.05$) affected by changing pH. Heating WPI at pH 4.0 reduced rate and amount of overrun. Highest overrun values for unheated WPI were observed at pH 5.0 and 7.0 after heating at 55°C for 10 min. Maximum foam stability for unheated WPI was obtained at pH 5.0. Heat treatment had little effect on stability at pH 4.0 or 7.0 but at pH 5.0, 80°C for 10 min improved stability by 65%. Based on surface pressure data, rate of adsorption of β- **lactoglobulin** interfacial films and the work of compression correlated with overrun, maximum overrun, overrun development and foam stability.
CC G (Catering, Speciality and Multicomponent Foods)
CT DAIRY PRODUCTS; FOAMS; HEATING; PH; PROTEINS; PROTEINS MILK; STABILITY; **WHEY**; **PROTEIN ISOLATES**

L8 ANSWER 82 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1990(06):G0009 FSTA
TI Reduction of Streptococcus thermophilus in a **whey protein isolate** by low moisture extrusion cooking without loss of functional properties.
AU Queguiner, C.; Dumay, E.; Cavalier, C.; Cheftel, J. C.
CS Correspondence (Reprint) address, J. C. Cheftel, Lab. de Biochimie et Tech. Alimentaires, Cent. de Genie et Tech. Alimentaires, Univ. de Sci. et Tech., 34095 Montpellier, France
SO International Journal of Food Science & Technology, (1989), 24 (6) 601-612, 10 ref.
DT Journal
LA English
AB A **whey protein isolate** powder (WPI, 4-5% water), inoculated with 5 x 10.sup.5 viable Streptococcus thermophilus/g, was continuously processed in a twin screw extruder under the following conditions: barrel length, 500 or 1000 mm; screw profile, forward transport and compression elements; moisture content during extrusion, 4-5%; feed rate, 10 kg h.sup.-.sup.1; barrel temperature (T.sub.b), 80-204°C; speed of screw rotation, 50 rev/min. The min. residence time determined by pulse injection of erythrosin was 20-25 s (500 mm barrel) or 35-40 s (1000 mm barrel). Reduction values of viable S. thermophilus of 10.sup.4.sup...sup.2-fold (500 mm barrel, T.sub.b = 143°C) or 10.sup.4.sup...sup.9-fold (1000 mm barrel, T.sub.b = 133°C) were obtained without any modification of **protein** solubility or gelling properties. WPI extruded at highest barrel temperature (182-204°C) underwent limited browning and reduction of **protein** solubility. Gel permeation and hydrophobic interaction chromatography of the soluble constituents did not show any aggregates of β- **lactoglobulin** or α- **lactalbumin**. Gels prepared from control or extruded WPI (T.sub.b ≤ 143°C with a barrel length of 500 mm or T.sub.b ≤ 133°C with a barrel length of 1000 mm) were identical, as judged by SEM and rheological evaluations.
CC G (Catering, Speciality and Multicomponent Foods)
CT BACTERIA; COOKING; DAIRY PRODUCTS; EXTRUSION; FUNCTIONAL PROPERTIES; PROTEINS; PROTEINS MILK; REDUCTION; STREPTOCOCCUS; **WHEY**;

DRIED WHEY; EXTRUSION COOKING; **PROTEIN ISOLATES**

L8 ANSWER 83 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1990(01):P0062 FSTA
TI [Studies on elimination of β- **lactoglobulin** from **whey** using carboxymethyl cellulose cation exchanger. Effects of pH and desalting of **whey** on fractionation of β-**lactoglobulin**.]
AU Ohtomo, H.; Hamamatsu, K.; Hori, E.; Kuwata, T.
CS Cent. Res. Inst. of Meiji Milk Products Co. Ltd., 1-21-3, Sakae-cho, Higashimurayama-shi, Tokyo 189, Japan
SO Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi], (1988), 35 (11) 755-762, 17 ref.
ISSN: 0029-0394
DT Journal
LA Japanese
SL English
AB Effects of pH and desalting on elimination of β- **lactoglobulin** (β-LG) from bovine **whey** using a CMC cation exchanger were investigated. Desalting of **whey** enhanced the amount of β-LG adsorbed onto CMC cation exchanger, but excess desalting, >90% as conductivity, reduced selective adsorption of β-LG. Selective adsorption of β-LG on CMC could be performed at pH 4.6 in the case of **whey** dialysed for 48 h. If pH of **whey** was <4.0, not only β-LG, but also other proteins, e.g. α- **lactalbumin**, bovine serum albumin and immunoglobulins, were adsorbed onto CMC. If, however, pH was >5.0, major **whey** proteins including β-LG could not be adsorbed onto CMC. 2 types of freeze-dried **whey protein** fractions could be obtained. 1 was β-LG eliminated **whey** powder, which showed good solubility and heat stability, and the other was β-LG rich **whey protein isolate**. β-LG accounted for <20% of major proteins in the β-LG eliminated fraction, and >90% of major proteins in the β-LG rich fraction.
CC P (Milk and Dairy Products)
CT CELLULOSES; CHROMATOGRAPHY; DAIRY PRODUCTS; ION EXCHANGE; LACTOGLOBULINS; PROTEINS; **WHEY**; **Nb -LACTOGLOBULIN**; CARBOXYMETHYLCELLULOSE

L8 ANSWER 84 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1990(01):B0014 FSTA
TI Sulfhydryl group/disulfide bond interchange reactions during heat-induced gelation of **whey protein isolate**.
AU Shimada, K.; Cheftel, J. C.
CS Lab. de Biochimie et Tech. Alimentaires, Cent. de Genie et Tech. Alimentaires, Univ. des Sci. et Tech. du Languedoc, 34060 Montpellier Cedex, France
SO Journal of Agricultural and Food Chemistry, (1989), 37 (1) 161-168, 32 ref.
ISSN: 0021-8561
DT Journal
LA English
AB The kinetics of reaction between the SH group of β-**lactoglobulin** and 5,5'-dithiobis(2-nitrobenzoic acid) (DTNB) were used to detect the SH/S-S interchange reactions taking place when dispersions of **whey protein isolate** (1 or 9% **protein**) were heated at 85°C at pH 7.5 or 2.5. The method is based on the assumption that the reactivity of the SH.sup.1.sup.2.sup.1 group adjacent to the S-S.sup.1.sup.0.sup.6.sup.-.sup.1.sup.1.sup.9 bond (native state) is low in the presence of SDS. The new SH group formed in position 66 or 160 through an SH/S-S interchange reaction reacts rapidly with DTNB in the presence of SDS. Data on reaction kinetics were compared with those of **protein** solubility, gel texture and SDS-PAGE.

Heating a 9% **protein** dispersion caused formation of a highly elastic gel at pH 7.5 [intermolecular S-S bonds due essentially to SH/S-S interchange reactions are predominant in the gel network and partly responsible for high elasticity] and formation of a nonelastic gel at pH 2.5.

CC B (Biotechnology)

CT DAIRY PRODUCTS; GELATION; HEATING; PROTEINS; PROTEINS MILK; **WHEY**; HEAT; **PROTEIN ISOLATES**

L8 ANSWER 85 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1989(09):G0019 FSTA

TI Effects of lysozyme, clupeine, and sucrose on the foaming properties of **whey protein isolate** and β-**lactoglobulin**.

AU Phillips, L. G.; Yang, S. T.; Schulman, W.; Kinsella, J. E.

CS Inst. of Food Sci., Cornell Univ., Ithaca, NY 14853, USA

SO Journal of Food Science, (1989), 54 (3) 743-747, 15 ref.
ISSN: 0022-1147

DT Journal

LA English

AB Lysozyme and clupeine interacted with β- **lactoglobulin** to form aggregates. Sucrose reduced the aggregation. Addition of lysozyme to β- **lactoglobulin** reduced the time required to reach an overrun maximum and increased foam stability and heat stability. Lysozyme also improved overrun, foam stability and heat stability of foams made with **whey protein isolate** (WPI). Lysozyme and sucrose further improved foaming properties of β-**lactoglobulin** and WPI. Addition of clupeine and sucrose gave similar results. Foaming properties of β- **lactoglobulin** and WPI containing sucrose and lysozyme were superior to those of egg white.

CC G (Catering, Speciality and Multicomponent Foods)

CT DAIRY PRODUCTS; FOAMS; GLYCOSIDASES; LACTOGLOBULINS; PROTEINS; PROTEINS MILK; SUCROSE; **WHEY**; **Nb -LACTOGLOBULIN**; CARBOHYDRASES; FOAM; LYSOZYME; MILK PROTEINS; **PROTEIN ISOLATES**; **WHEY PROTEIN ISOLATES**

L8 ANSWER 86 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1988(10):G0031 FSTA

TI Creaming stability of fluid emulsions containing different milk **protein** preparations.

AU Leman, J.; Haque, Z.; Kinsella, J. E.

CS Inst. of Food Sci., Cornell Univ., Ithaca, NY 14853, USA

SO Milchwissenschaft, (1988), 43 (5) 286-289, 26 ref.
ISSN: 0026-3788

DT Journal

LA English

SL German

AB Effects of pH, ionic strength, **protein** concentration, energy input and heat treatment on creaming stability of emulsions made with whole milk proteins (MP), β- **lactoglobulin** (β-Lg), **whey protein isolate** (WPI) and micellar casein (MC) were studied at an oil:water ratio of 4:6. Increasing the energy input using a single-piston recirculating homogenizer improved emulsion stability. More stable emulsions were obtained as **protein** concentration were increased from 1 to 3% and, in the pH range 6-9, stability was lowest at pH 6. Under the conditions used β-Lg formed emulsions with best creaming stability, the order being β-Lg > WPI > MP > MC. Emulsions were stable following heating at 70 or 80°C for 5-20 min.

CC G (Catering, Speciality and Multicomponent Foods)

CT CREAM; DAIRY PRODUCTS; EMULSIONS; MILK; PROTEINS; PROTEINS MILK; STABILITY; CREAMING; MILK EMULSIONS; MILK PROTEINS

L8 ANSWER 87 OF 191 FSTA COPYRIGHT 2004 IFIS on STN

AN 1986(02):P0020 FSTA
TI Functional properties of heat-denatured **whey** proteins. II. Emulsification and foaming properties.
AU Mutilangi, W. A. M.; Kilara, A.
CS Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA
SO Milchwissenschaft, (1985), 40 (7) 391-393, 9 ref.
DT Journal
LA English
SL German
AB Recovery of **whey** proteins by heat precipitation followed by solubilization of the **whey protein concentrate** (WPC) at pH 7.0 to give a **whey protein isolate** (WPI), resulted in the conversion of β- **lactoglobulin** from the dimer form in the **whey** to the monomer in the WPI. An optimal emulsifying activity index value of 164.80 m.sup.2/g was obtained at pH 6.31 and a **protein** concentration of 1.08%. The optimal foaming capacity value (9.97 cm.sup.3) was obtained at pH 7.15 and a **protein** concentration of 1.07% while an optimal foam stability value of 1.60 min/cm.sup.3 was obtained for a combination of pH 6.81 and **protein** concentration of 1.31%.
CC P (Milk and Dairy Products)
CT DENATURATION; EMULSIFIERS; FOAMS; FUNCTIONAL PROPERTIES; HEATING; PH; **PROTEINS MILK**; **WHEY**; EMULSIFICATION PROPERTIES; FOAMING PROPERTIES; HEAT-DENATURED; **WHEY PROTEINS**

L8 ANSWER 88 OF 191 FSTA COPYRIGHT 2004 IFIS on STN
AN 1978(01):P0003 FSTA
TI High purity **protein** recovery.
AU Palmer, D. E.
CS Viscose Group Ltd., Swansea, UK
SO Process Biochemistry, (1977), 12 (5) 24-26, 28
DT Journal
LA English
AB Recovery of high purity, undenatured, functional **protein** from cheese **whey** by the Vistec process is detailed. The process uses a newly developed range of regenerated cellulose ion exchange materials which have the ability to adsorb selectively great quantities of high mol. weight materials, particularly proteins, from solution. The plant consists essentially of a hold tank and filter bottom stirred tank reactor; when the reactor is drained, media are retained by the filter and thus separated from process liquors. The process consists of 3 main operations: separation and isolation of **protein** by the Vistec system; concentration of the proteinaceous eluate, usually by ultrafiltration; and spray-drying to recover **protein** powder. Flow-sheets of the plant and of the process sequence are included. The Vistec process can be used as a primary treatment system or in conjunction with established methods of **whey** treatment (e.g. with whole **whey** drying, with ultrafiltration, with pre-concentration by ultrafiltration, and by incorporation into an existing ultrafiltration system); these combined systems are described with the aid of flow diagrams and tabulated process data. The chemical and functional properties of the **whey protein isolate** produced by the Vistec process are discussed and the economics of the process considered. The **isolate** is a virtually pure **protein** product (97% **protein** in DM), consisting of a mixture of α- **lactalbumin** and β- **lactoglobulin**, is substantially free of fat and lactose, has a low ash content, and is soluble and undenatured. It has excellent functional properties (solubility, foam stability, gelation) and can in many products serve as a complete replacement for egg white.
CC P (Milk and Dairy Products)

CT CHEESE; EGG WHITES; EXTRACTION; PLANTS; **PROTEIN PRODUCTS**; PROTEINS; PROTEINS MILK; PURITY; **WHEY**; **CHEESE WHEY**; **CHEESE WHEY PROTEINS**; HIGH; HIGH # REPLACEMENT; **WHEY PROTEINS**

L8 ANSWER 89 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 646140 FROSTI
TI Heat-induced changes in the ultrasonic properties of **whey** proteins.
AU Corredig M.; Verespej E.; Dalgleish D.G.
SO Journal of Agricultural and Food Chemistry, 2004, (July 14), 52 (14), 4465-4471 (25 ref.)
Published by: http://pubs.acs.org/jafc
ISSN: 0021-8561
DT Journal
LA English
SL English
AB The molecular interactions occurring during heating in situ of **whey protein isolate** and purified beta-**lactoglobulin** were examined using high-resolution ultrasound spectroscopy. Changes in the ultrasonic properties occurred in the early stages of heating; during heating, the relative ultrasound velocity decreased continuously with temperature. At temperatures less than 50 C, the ultrasonic attenuation decreased; at 70 C, a decrease in the relative velocity and an increase in the attenuation were indicators of **protein** denaturation and the formation of a gel network.
SH PROTEINS
CT BETA **LACTOGLOBULIN**; DEGRADATION; DENATURATION; GELATION; HEATING; **LACTOGLOBULIN**; MILK PROTEINS; PROTEINS; SPECTROSCOPY; ULTRASONICS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS
DED 19 Aug 2004

L8 ANSWER 90 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 643390 FROSTI
TI Soluble complexes of gum arabic with alpha -**lactalbumin** and beta lacto globulin above the **protein** isoelectric point: analysis in terms of charge patches.
AU de Vries R.
SO Food colloids, biopolymers and materials: proceedings of a conference, Wageningen, April 2002., Published by: RSC, Cambridge, 2003, 329-336 (12 ref.)
Dickinson E.; van Vliet T.; Royal Society of Chemistry.
ISBN: 0-85404-871-5
DT Conference Article
LA English
AB This study looks at macroscopic phase separation. The qualitative idea of charge patches is worked out in detail for the specific case of gum arabic with alpha **lactalbumin** and beta **lactoglobulin**. In order to explain results on complexation in mixtures of **whey** proteins and gum arabic the charge patches are analysed for both alpha **lactalbumin** and beta **lactoglobulin**. Also for the case of binding to multiple small patches, analytical estimates are developed for the salt dependent critical pH at which soluble complexes first form. These are compared to the experimental data for a gum arabic and **whey protein isolate** system.
SH PROCESSING
CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; GUM ARABIC; GUMS; HYDROCOLLOIDS; **LACTALBUMIN**; **LACTOGLOBULIN**; MILK PROTEINS; PROTEINS
DED 21 Jul 2004

L8 ANSWER 91 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 643020 FROSTI
TI What's so good about **milk**?
AU Deeprose J.
SO International Food Ingredients, 2004, (June-July), (3), 36+38 (0 ref.)
Published by: http://www.ifi-online.com
ISSN: 0924-5863
DT Journal
LA English
AB Applications of **milk** derivatives and ingredients in the food processing industry are discussed. **Whey protein** concentrates with a **protein** content of more than 80% can give good gelling and water-binding in the preparation of meat products. Hiprotal 580HG is a new **whey protein concentrate** containing high levels of beta-**lactoglobulin** that can be used to improve the texture, taste and nutritional value of food products. Domvictus, a **concentrate** range with lower **protein** levels, includes 835MP modified to enhance the fat impression in low-fat yoghurts and 535 described as a functional ingredient for gelling. Casein and caseinates are used for emulsifying and stabilising nutritional drinks. Caseino glycomacropeptide (CGMP), a bioactive peptide made from sweet **whey**, appears to have potential as a prebiotic in functional food. Functional properties and applications of **milk protein** isolates and **whey protein** concentrates are described. Research into the health benefits of **whey** proteins have resulted in a new generation of functional foods, focusing on the bioactive properties of ingredients. Casein and **whey** proteins can be degraded, fermented, isolated and concentrated, giving functional peptides that behave differently. EMSER is a high **protein milk** derivative used as an emulsifier/stabiliser in meat products. The **milk protein** fraction Try-Pro is claimed to enhance serotonin secretion.
SH PROTEINS
CT APPLICATIONS; BIOACTIVE PEPTIDES; CASEIN; CASEINATES; DAIRY PRODUCTS; FUNCTIONAL FOODS; FUNCTIONAL INGREDIENTS; FUNCTIONAL PROPERTIES; INGREDIENTS; **MILK PROTEIN**; **MILK** PROTEINS; PEPTIDES; **PROTEIN**; PROTEINS; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**
DED 16 Jul 2004

L8 ANSWER 92 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 642523 FROSTI
TI Sustained improver of muscular fatigue.
IN Tsuchita H.; Saito M.; Kamiya T.; Komatsu M.
PA Meiji Dairies Corp.; Kyowa Hakko Kogyo Co. Ltd
SO PCT Patent Application
PI WO 2004049830 A1
AI 20031202
PRAI Japan 20021202
DT Patent
LA English
SL English
AB A novel composition for sustained improvement of muscle fatigue is described. The composition consists of branched chain amino acids, leucine, isoleucine, valine, and glutamine, and a **whey protein** component. The **whey protein** component can be a **whey protein isolate**, a **whey protein concentrate**, an alpha-**lactalbumin concentrate**, and a beta-**lactoglobulin concentrate** and the decomposition product of **whey protein** such as hydrolysate. The invention is suitable for use in foods, drinks, and pharmaceuticals. It can be

used in healthy foods, juices, soft drinks, teas, lactic acid bacteria beverages, fermented **milk**, **milk** products and snacks such as candy, drops, chocolate, jelly, biscuit, cookie, and ice cream. The invention can also be used as oral agents such as tablets, capsules, syrup, and sublingual tablets.

SH FUNCTIONAL FOODS

CT AMINO ACIDS; BEVERAGES; DIETARY ADDITIVES; DIETARY SUPPLEMENTS; FUNCTIONAL FOODS; HEALTH DRINKS; HEALTH FOODS; **MILK** PROTEINS; NON ALCOHOLIC BEVERAGES; PATENT; PCT PATENT; PROTEINS; **WHEY** PROTEINS

DED 12 Jul 2004

L8 ANSWER 93 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 641888 FROSTI

TI Heat treatment of **whey** proteins in the presence of anionic surfactants.

AU Giroux H.J.; Britten M.

SO Food Hydrocolloids, 2004, (July), 18 (4), 685-692 (33 ref.)
Published by: http://www.elsevier.nl/locate/foodhyd
ISSN: 0268-005X

DT Journal

LA English

SL English

AB **Whey protein isolate**, containing beta-**lactoglobulin**, alpha-**lactalbumin** and bovine serum albumin, was heated in solutions of various concentrations of three anionic surfactants: sodium dodecyl sulfate, sodium stearoyl-2-lactylate, and diacetyl tartaric acid ester of monoglyceride. The kinetics of **whey protein** denaturation and denaturation enthalpy and temperature were determined. The resulting **whey protein**-surfactant complexes were examined for **protein** solubility profile, hydrodynamic diameter and surface activity. Results showed that the anionic surfactants bound to the **whey** proteins and modified their thermal behaviour. This could have applications for food systems.

SH PROTEINS

CT ANIONIC SURFACTANTS; BINDING; DAIRY PRODUCTS; DEGRADATION; DENATURATION; HEAT PROCESSING; HEAT TREATMENT; HEATING; MILK **PROTEIN**; MILK PROTEINS; PROCESSING; **PROTEIN**; PROTEINS; SURFACTANTS; THERMAL PROPERTIES; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS

DED 6 Jul 2004

L8 ANSWER 94 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 636754 FROSTI

TI Separation and characterization of beta-**lactoglobulin** and alpha-**lactalbumin** from **whey** and **whey protein** preparations.

AU Alomirah H.F.; Alli I.

SO International Dairy Journal, 2004, (May), 14 (5), 411-419 (35 ref.)
Published by: Elsevier Science. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 485 3757. Fax: +31 (20) 485 3432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/idairyj
ISSN: 0958-6946

DT Journal

LA English

SL English

AB **Whey** proteins are widely used in the food industry for their functional and nutritional properties. Effective techniques are needed for the large-scale fractionation and purification of beta-**lactoglobulin** and alpha-**lactalbumin**. The separation of these proteins from commercial samples of liquid **whey**, **whey protein isolate** and **whey**

protein concentrate using fractionation was studied. The properties of the obtained beta-**lactoglobulin** and alpha-**lactalbumin** were examined. Moisture, **protein** and ash contents, composition, purity, yield and electrophoretic patterns were determined. The beta-**lactoglobulin** and alpha-**lactalbumin** proteins in the **protein** fractions obtained from **whey protein concentrate** showed higher molecular weights due to a higher degree of glycation, compared to **protein** fractions from liquid **whey** and **whey protein isolate**.

SH PROTEINS

CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; COMPOSITION; DAIRY PRODUCTS; ELECTROPHORETIC PATTERNS; EXTRACTION; FRACTIONATION; **LACTALBUMIN**; **LACTOGLOBULIN**; LIQUID **WHEY**; **MILK PROTEIN**; **MILK** PROTEINS; **PROTEIN** ; PROTEINS; PURIFICATION; PURITY; SEPARATION; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS; YIELD

DED 29 Apr 2004

L8 ANSWER 95 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 636333 FROSTI

TI Influence of stabilizing bonds on the texture properties of high-pressure-induced **whey protein** gels.

AU Keim S.; Hinrichs J.

SO International Dairy Journal, 2004, (April), 14 (4), 355-363 (many ref.) Published by: Elsevier Science. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 485 3757. Fax: +31 (20) 485 3432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/idairyj ISSN: 0958-6946

NTE 3rd NIZO Dairy Conference - Dynamics of texture, process and perception (Part 2).

DT Journal

LA English

SL English

AB Pressure-induced denaturation, aggregation and gelation of **whey** proteins depend on the **protein** system used and the applied process conditions. Operating pressure and pressure holding time are key parameters influence **whey protein** unfolding and denaturation. The gel formation of **whey protein isolate** (WPI) induced by high pressure was studied at 600 MPa, 30 C and holding times of 0-30 minutes. The formation of disulfide bonds, contents of **protein** fractions, texture, gel strength and elasticity were determined. The content of native **whey protein** fractions (alpha-**lactalbumin**, beta-**lactoglobulin** A and B) decreased and the amount of intramolecular disulfide bonds increased with increasing pressure holding time, making the gels stronger and more elastic. The amount of intramolecular disulfide bonds appeared to directly influence the texture properties of high-pressure-induced **whey protein** gels.

SH DAIRY PRODUCTS

CT CHEMICAL BONDS; DEGRADATION; DENATURATION; DISULFIDE BONDS; FORMATION; GELS; HIGH PRESSURE; MILK PROTEINS; PROTEINS; SENSORY PROPERTIES; STABILIZING BONDS; STRENGTH; TEXTURE; **WHEY** PROTEINS

DED 27 Apr 2004

L8 ANSWER 96 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 636313 FROSTI

TI **Whey protein isolate** and alpha-**lactalbumin** recovery from lactic acid **whey** using cation-exchange chromatography.

AU Turhan K.N.; Etzel M.R.

SO Journal of Food Science, 2004, (March), 69 (2), FEP66-FEP70 (34 ref.)
Published by: Institute of Food Technologists. Address: 221 N. LaSalle Street, Suite 300, Chicago, IL 60601-1291, USA. Telephone: +1 (312) 782 8424. Fax: +1 (312) 782 0045. Email: info@ift.org Web: www.ift.org/resource/publ/jfs/jfs.shtml
ISSN: 0022-1147
DT Journal
LA English
SL English
AB **Whey protein isolate** (WPI) is a value-added product that could be made from lactic acid **whey**. A cation-exchange column chromatography process was developed to manufacture alpha-**lactalbumin** and WPI from lactic acid **whey**. Process steps, recovery of WPI and alpha-**lactalbumin**, and binding capacity and throughput are reported. The process operates at high flow rate, high recovery and high purity, with 96% composite recovery of the major **whey** proteins.
SH PROTEINS
CT ALPHA **LACTALBUMIN**; CATION EXCHANGE CHROMATOGRAPHY; CHROMATOGRAPHY; FRACTIONATION; **LACTALBUMIN**; LACTIC ACID **WHEY**; MILK PROTEINS; PROTEINS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS
DED 27 Apr 2004

L8 ANSWER 97 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 635682 FROSTI
TI Effect of processing on the displacement of **whey** proteins: applying the orogenic model to a real system.
AU Woodward N.C.; Wilde P.J.; Mackie A.R.; Gunning A.P.; Gunning P.A.; Morris V.J.
SO Journal of Agricultural and Food Chemistry, 2004, (March 10), 52 (5), 1287-1292 (15 ref.)
Published by: American Chemical Society. Address: 2540 Olentangy River Road, PO Box 3330, Columbus, OH 43210, USA. Telephone: +1 (614) 447 3665. Fax: +1 (614) 447 3745. Email: acsproof@acs.org Web: http://pubs.acs.org/jafc
ISSN: 0021-8561
DT Journal
LA English
SL English
AB The applicability of the generic principles of the orogenic model to real **protein** systems used in the food industry was investigated. The displacement of a commercial **whey protein** system, and the behaviour compared with that of beta-**lactoglobulin** was compared. The **whey protein isolate** (WPI) was more resistant to displacement than beta-**lactoglobulin**. Complete displacement of WPI occurred in the presence of Tween 20. Surface shear rheology showed that the WPI film broke down at a greater stress than that observed for beta-**lactoglobulin** films; the authors suggest that interactions between **protein** molecules are greater for the WPI film than those for beta-**lactoglobulin**.
SH PROTEINS
CT BETA **LACTOGLOBULIN**; DISPLACEMENT; **LACTOGLOBULIN**; MILK PROTEINS; MODELS; OROGENIC MODEL; PROCESSING; PROTEINS; SURFACTANTS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS
DED 22 Apr 2004

L8 ANSWER 98 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 635664 FROSTI
TI Cross-linking and rheological changes of **whey** proteins treated with microbial transglutaminase.
AU Truong V.-D.; Clare D.A.; Catignani G.L.; Swaisgood H.E.
SO Journal of Agricultural and Food Chemistry, 2004, (March 10), 52 (5),

1170-1176 (28 ref.)
Published by: American Chemical Society. Address: 2540 Olentangy River Road, PO Box 3330, Columbus, OH 43210, USA. Telephone: +1 (614) 447 3665. Fax: +1 (614) 447 3745. Email: acsproof@acs.org Web: http://pubs.acs.org/jafc
ISSN: 0021-8561
DT Journal
LA English
SL English
AB The factors affecting the degree of cross linking of **whey protein isolate** (WPI) were examined using microbial transglutaminase (TGase), and the rheological properties of the modified proteins were characterised. With high TGase/substrate ratios, cross linking of the major components of WPI, alpha-**lactalbumin**, and beta-**lactalbumin** occurred. The intra- and interchain cross linking is suggested to have caused formation of polymers too large for effective network development, resulting in a decrease in gel strength. The authors conclude that a process could be developed to produce heat-stable **whey** proteins for different food applications.
SH PROTEINS
CT CROSS LINKING; ENZYMES; FACTORS AFFECTING; MICROBIAL ENZYMES; MILK PROTEINS; PROTEINS; RHEOLOGICAL PROPERTIES; TRANSGLUTAMINASE; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS
DED 22 Apr 2004

L8 ANSWER 99 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 635357 FROSTI
TI Immunomodulating effects of **whey** proteins and their enzymatic digests.
AU Mercier A.; Gauthier S.F.; Fliss I.
SO International Dairy Journal, 2004, (March), 14 (3), 175-183 (39 ref.)
Published by: Elsevier Science. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 485 3757. Fax: +31 (20) 485 3432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/idairyj
ISSN: 0958-6946
DT Journal
LA English
SL English
AB Commercial **whey** proteins have been shown to affect the immune system. The immunomodulating properties of commercial **whey protein** products and their enzymic digests obtained with a mixture of trypsin chymotrypsin were examined by measuring their effects on in vitro proliferation of lymphocytes isolated from murine spleen. The **whey protein** products were **whey protein** isolates (WPI), beta-**lactoglobulin**, alpha-**lactalbumin**, lactoferrin and glycomacropeptide (GMP). The **whey protein** products and their enzymic digests were analysed by HPLC. Microfiltered-WPI increased lymphocyte proliferation and ionic exchange-WPI and lactoferrin had an inhibitory effect. Beta-**lactoglobulin**, alpha-**lactalbumin** and GMP had no effect. Enzymic digestion reduced the stimulating activity of microfiltered WPI and the inhibitory effects of ionic exchange-WPI and lactoferrin. Fractionation of enzymic digests resulted in peptide fractions that stimulated cell proliferation at lower concentrations than those obtained for total hydrolysates. The results suggest that **whey** proteins contain immunomodulating peptides that can be released by enzymic digestion.
SH PROTEINS
CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; ENZYMIC DIGESTION; GLYCOMACROPEPTIDE; IMMUNE SYSTEM; **LACTALBUMIN**; LACTOFERRIN; **LACTOGLOBULIN**; LYMPHOCYTES; MILK PROTEINS; PROLIFERATION; PROTEINS; **WHEY PROTEIN ISOLATE** ; **WHEY** PROTEINS

DED 20 Apr 2004

L8 ANSWER 100 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 633436 FROSTI
TI Influence of kappa-carrageenan on the aggregation behaviour of proteins in heated **whey protein isolate** solutions.
AU de la Fuente M.A.; Hemar Y.; Singh H.
SO Food Chemistry, 2004, (June), 86 (1), 1-9 (21 ref.)
Published by: Elsevier Science Ltd. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 4853757. Fax: +31 (20) 4853432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/foodchem
ISSN: 0308-8146
DT Journal
LA English
SL English
AB **Whey protein** products are able to form a gel after heat-induced denaturation and aggregation. The effects of adding the polysaccharide kappa-carrageenan to 2% **whey protein isolate** (WPI) at pH 7 and heating at 75 C for 1-60 minutes were studied using size-exclusion chromatography combined with multiangle laser light scattering and gel electrophoresis. Kappa-carrageenan addition had no significant effect on the rate of loss of native beta-**lactoglobulin** and alpha-**lactalbumin** and reduced the molecular weights of aggregates for heating times up to 2.5 minutes. WPI samples heated in the absence of kappa-carrageenan for up to 5 minutes remained homogeneous. WPI/kappa-carrageenan mixtures showed smaller clusters and more uniform pore size distributions.
SH PROTEINS
CT AGGREGATION; CARRAGEENAN; GELLING AGENTS; HEATING; KAPPA CARRAGEENAN; MILK PROTEINS; POLYSACCHARIDES; PROTEINS; **WHEY PROTEIN** ISOLATES; **WHEY** PROTEINS
DED 19 Mar 2004

L8 ANSWER 101 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 631351 FROSTI
TI Living nutrition. (Undenatured **whey protein isolate** containing active lactoferrin.)
AU Anon.
SO Food Ingredients and Analysis International, 2003, (December), 25 (6), 14-16 (0 ref.)
Published by: Turret RAI plc. Address: Armstrong House, 38 Market Square, Uxbridge, Middlesex UB8 1TG, UK. Telephone: +44 (1895) 454545. Fax: +44 (1895) 454647. Email: agrifood@turret-rai.co.uk Web: www.turret-rai.com
ISSN: 0968-574X
DT Journal
LA English
AB Vitalarmor LFX-100 is an undenatured **whey protein isolate** that contains a high level of biologically active lactoferrin. This article considers the **protein** composition, amino acid profile, and lactoferrin content of Vitalarmor LFX-100. The manufacturing process for Vitalarmor LFX-100, and its high concentration of intact lactoferrin are discussed. The content of immunoreactive lactoferrin and the growth-promoting effect in a human intestinal cell line are also examined. Vitalarmor LFX-100 is reported to provide amino acids and strengthen the body's resistance.
CT AMINO ACIDS; BETA **LACTOGLOBULIN**; BIOACTIVE PEPTIDES; CONTENT; HEALTH BENEFITS; IMMUNE SYSTEM; LACTOFERRIN; **LACTOGLOBULIN**; MILK PROTEINS; NUTRITIONAL VALUE; PEPTIDES; PROTEINS; VITALARMOR; **WHEY PROTEIN ISOLATE**
DED 26 Feb 2004

L8 ANSWER 102 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 627299 FROSTI
TI Use of multi-angle laser light scattering and size-exclusion chromatography to characterize the molecular weight and types of aggregates present in commercial **whey protein** products.
AU Wang T.; Lucey J.A.
SO Journal of Dairy Science, 2003, (October), 86 (10), 3090-3101 (32 ref.) Published by: American Dairy Science Association. Address: 1111 N. Dunlap Ave., Savoy, IL 61874, USA. Telephone: +1 (217) 356 3182. Fax: +1 217 398 4119. Email: adsa@assochq.org Web: www.adsa.org ISSN: 0022-0302
DT Journal
LA English
SL English
AB **Whey protein** products are used widely in the food industry for their functional and nutritional properties. There is little published information regarding the weight average molar mass and size distribution of molecules in **whey protein** products, and this would be useful to better understand their functional behaviour as a food ingredient. Seven commercial **whey protein isolate** samples and eight **whey protein concentrate** samples were characterized using size-exclusion chromatography with a multi-angle laser light scattering (MALLS) detector, photodiode array detector, or differential refractive index detector. The differences in the concentrations of some of the major proteins (e.g. **lactoglobulin** and BSA) between the isolates are discussed. There were also differences between the samples in the quantity of residual lipids, and the effect of this is discussed.
SH PROTEINS
CT CHEMICAL STRUCTURE; IDENTIFICATION; **MILK** PROTEINS; MOLECULAR PROPERTIES; MOLECULAR STRUCTURE; PROTEINS; **WHEY PROTEIN** PRODUCTS; **WHEY** PROTEINS
DED 20 Jan 2004

L8 ANSWER 103 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 625153 FROSTI
TI Effect of pre-heating on the foaming properties of **whey protein isolate** using a membrane foaming apparatus.
AU Bals A.; Kulozik U.
SO International Dairy Journal, 2003, 13 (11), 903-908 (17 ref.) Published by: Elsevier Science. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 485 3757. Fax: +31 (20) 485 3432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/idairyj ISSN: 0958-6946
DT Journal
LA English
SL English
AB Partial unfolding of the **protein** molecule enhances foam formation, while heat-induced aggregation and polymerization of **whey** proteins are known to impair foaming properties. The influence of denaturation of **whey** proteins, particularly beta-**lactoglobulin**, on the foaming properties of **whey protein** solutions in a membrane system was investigated. Membrane foaming is a new technology that uses microporous membranes for the formation of foams. This type of foaming is a gentle method that prevents additional denaturation of proteins by shear forces. The effect of thermal denaturation of **whey** proteins on the formation, stability and structure of their respective foams was examined. Denaturation of beta-**lactoglobulin**, the main component in **whey protein isolate**, was shown to greatly improve foam stability. At a denaturation degree of more than 70%, it was possible to reduce drainage to a large extent. Image analysis

demonstrated that higher levels of denaturation of the proteins, and thus higher viscosities of the **protein** solution, produced coarser foam textures with larger bubbles. Incorporation of the bubble was found to be more difficult when the viscosity of the continuous phase was high.

SH PROTEINS

CT BETA **LACTOGLOBULIN**; DEGRADATION; DENATURATION; FOAMING PROPERTIES; FOAMS; FORMATION; FUNCTIONAL PROPERTIES; HEATING; **LACTOGLOBULIN**; MEMBRANES; MILK PROTEINS; PREHEATING; PROTEINS; STABILITY; STRUCTURE; **WHEY** PROTEINS

DED 19 Dec 2003

L8 ANSWER 104 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 622341 FROSTI

TI Mineral modulation of thermal aggregation and gelation of **whey** proteins: from beta-**lactoglobulin** model system to **whey protein isolate**.

AU Caussin F.; Famelart M.-H.; Maubois J.-L.; Bouhallab S.

SO Lait, 2003, (September-October), 83 (5), 353-364 (28 ref.)
Published by: EDP Sciences S.A. Address: 7 Avenue du Hoggar, PA de Courtaboeuf, BP 112, 91944 Les Ulis Cedex A, France. Web: www.edpsciences.org
ISSN: 0023-7302

DT Journal

LA English

SL English; French

AB The effects of optimum mineral concentration on the formation of aggregates in concentrated **whey protein** systems were examined in this study. The properties of aggregates and gels formed by beta-**lactoglobulin** singly or in complex systems were determined. Sodium chloride and calcium chloride increased gel strength and decreased gelation. Two aggregation pathways are described; the authors conclude that covalent interactions are involved between proteins in the formed aggregates, at pH 6.8.

SH PROTEINS

CT AGGREGATION; BETA **LACTOGLOBULIN**; CALCIUM; FACTORS AFFECTING; GELATION; GELS; **LACTOGLOBULIN**; MILK PROTEINS; MINERALS; PROPERTIES; PROTEINS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS

DED 6 Nov 2003

L8 ANSWER 105 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 621701 FROSTI

TI Separation technologies to produce dairy ingredients.

AU Bargeman G.

SO Dairy processing: improving quality., Published by: Woodhead Publishing Ltd., Cambridge, 2003, 366-390 (52 ref.)
Smit G.
ISBN: 1-85573-676-4

DT Book Article

LA English

AB **Whey**, produced in large quantities during cheese manufacturing, was originally discharged to the environment. The dairy industry has realized the value of ingredients present in **whey**. Processes to separate **milk**, and particularly **whey**, into different fractions and to **isolate** specific components from **milk** or **whey** to produce speciality products with a higher value have been developed. Examples of ingredients in **whey** and their potential applications are tabulated. The most important separation technologies currently used for production of these speciality products - crystallization, membrane filtration and chromatography - are discussed. Simulated moving bed chromatography has recently been introduced for the separation of valuable proteins from dairy streams. Production of **whey protein**

concentrates and **whey protein** isolates, and separation of lactose, alpha-**lactalbumin**, beta-**lactoglobulin**, and defence proteins such as lactoferrin, lactoperoxidase, immunoglobulins and growth factors are examined. Many of these dairy proteins contain fragments such as bioactive peptides and individual amino acids with specific functional properties. Enzymic hydrolysis of dairy proteins is used to produce these fragments, which are increasingly used in infant formula and sports drinks. Isolation of these components and the development of alternative separation technologies such as membrane absorbers and electro-membrane filtration are considered.

SH DAIRY PRODUCTS

CT ALPHA **LACTALBUMIN**; AMINO ACIDS; BETA **LACTOGLOBULIN**; BIOACTIVE PEPTIDES; CARBOHYDRATES; CHROMATOGRAPHY; CRYSTALLIZATION; DAIRY INGREDIENTS; DAIRY PRODUCTS; DEVELOPMENTS; ENZYMES; EXTRACTION; FILTRATION; GROWTH FACTORS; IMMUNOGLOBULINS; INGREDIENTS; ISOLATION; **LACTALBUMIN**; LACTOFERRIN; **LACTOGLOBULIN**; LACTOPEROXIDASE; LACTOSE; MEMBRANE FILTRATION; **MILK PROTEIN**; **MILK** PROTEINS; NITROGEN COMPOUNDS; ORGANIC COMPOUNDS; ORGANIC NITROGEN COMPOUNDS; PEPTIDES; **PROTEIN**; PROTEINS; SEPARATION; SUGARS; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**

DED 31 Oct 2003

L8 ANSWER 106 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 618068 FROSTI

TI Characterization of soluble aggregates from **whey protein isolate**.

AU Kazmierski M.; Corredig M.

SO Food Hydrocolloids, 2003, (September), 17 (5), 685-692 (33 ref.)

DT Journal

LA English

SL English

AB It has been reported that the heat-induced aggregation of **whey protein isolate** (WPI) forms gels, the structure and properties of which depend upon the medium composition, heating conditions and mechanism of aggregation. This study used size exclusion chromatography, multi-angle laser light scattering, dynamic light scattering and sodium dodecyl sulfate-polyacrylamide gel electrophoresis to investigate the effect of heating on the denaturation and subsequent aggregation of 10% WPI solutions at neutral pH and low ionic strength. The levels of residual native alpha-**lactalbumin** (AL) and beta-**lactoglobulin** (BLG) decreased with increasing time and temperature as aggregates of increasing molecular weight and hydrodynamic diameter formed. The results of electrophoresis showed the aggregates to have a BLG/AL ratio of about 2.0, regardless of the heating temperature or time.

SH PROTEINS

CT AGGREGATION; MILK PROTEINS; **PROTEIN**; **PROTEIN** ISOLATES; PROTEINS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS

DED 11 Sep 2003

L8 ANSWER 107 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 618065 FROSTI

TI Suppression of depletion flocculation in oil-in-water emulsions: a kinetic effect of beta-**lactoglobulin**.

AU Blijdenstein T.B.J.; van Vliet T.; van der Linden E.; van Aken G.A.

SO Food Hydrocolloids, 2003, (September), 17 (5), 661-669 (38 ref.)

DT Journal

LA English

SL English

AB **Whey protein isolate** has been shown to reduce the rate of depletion flocculation in oil-in-water emulsions. This study investigated the effect of adding beta-**lactoglobulin** (BLG) after emulsion formation, on creaming and flocculation in BLG-stabilized 10% oil-in-water emulsions, flocculated by the addition of dextran. It was found that higher levels of dextran were required to induce network formation as BLG concentration increased. This retardation of the flocculation process was explained in terms of mixed solutions of BLG and dextran having a high apparent viscosity at low shear rates.
SH ADDITIVES
CT BETA **LACTOGLOBULIN**; DEPLETION FLOCCULATION; EMULSIONS; FLOCCULATION; **LACTOGLOBULIN**; MILK PROTEINS; OIL IN WATER EMULSION; PROTEINS; STABILIZERS
DED 11 Sep 2003

L8 ANSWER 108 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 614325 FROSTI
TI Heat-induced gelation of **whey** proteins observed by rheology, atomic force microscopy and Raman scattering spectroscopy.
AU Ikeda S.
SO Food Hydrocolloids, 2003, (July), 17 (4), 399-406 (33 ref.)
Published by: Elsevier Science. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 485 3757. Fax: +31 (20) 485 3432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/foodhyd
ISSN: 0268-005X
NTE Special Issue on 6th International Hydrocolloids Conferences, Ontario, Canada, 15-19 July 2002.
DT Journal
LA English
SL English
AB Because of the mass production of **whey protein** ingredients as by-products from cheese manufacture, there is a continual demand for their effective utilization. In addition to functional properties, the physiological functions of **whey** proteins are also of interest. The rheological and structural transitions during the heat-induced gelation of **whey** proteins were studied using mechanical spectroscopy, atomic force microscopy and Raman scattering spectroscopy. The effects of added sodium chloride were evaluated. The heat-induced gelation of beta-**lactoglobulin** and **whey protein isolate** was confirmed to be a two-step process at neutral pH, involving the formation of granular primary aggregates followed by the aggregation of these aggregates, regardless of ionic concentration. The size of primary aggregates and the rate of aggregation increased with increasing sodium chloride concentrations. It is suggested that hydrophobic interactions are significantly involved in the formation of opaque gels.
SH DAIRY PRODUCTS
CT AGGREGATION; BETA **LACTOGLOBULIN**; CHEMICAL STRUCTURE; GELS; HEAT INDUCED GELATION; INGREDIENTS; **LACTOGLOBULIN**; MECHANISMS; MILK PROTEINS; MOLECULAR PROPERTIES; MOLECULAR STRUCTURE; PROTEINS; RHEOLOGICAL PROPERTIES; SALTS; SODIUM CHLORIDE; **WHEY PROTEIN ISOLATE**
DED 18 Jul 2003

L8 ANSWER 109 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 606177 FROSTI
TI Impact of **whey protein** emulsifiers on the oxidative stability of salmon oil-in-water emulsions.
AU Hu M.; McClements D.J.; Decker E.A.
SO Journal of Agricultural and Food Chemistry, 2003, (February 26), 51 (5), 1435-1439 (26 ref.)
Published by: American Chemical Society. Address: 2540 Olentangy River Road, PO Box 3330, Columbus, OH 43210, USA. Telephone: +1 (614) 447

3665. Fax: +1 (614) 447 3745. Email: acsproof@acs.org Web: http://pubs.acs.org/jafc
ISSN: 0021-8561
DT Journal
LA English
SL English
AB The susceptibility of lipids to oxidation is a major cause of quality deterioration in food emulsions. **Whey** proteins inhibit lipid oxidation in oil-in-water emulsions, and in this study, the oxidative stability of salmon oil-in-water emulsions stabilized by **whey protein isolate**, sweet **whey**, beta-**lactoglobulin**, or alpha-**lactalbumin** was evaluated. The effect of pH and temperature on the oxidative stability of **whey protein**-stabilized emulsions was also examined. The formation of lipid hydroperoxides and headspace propanal was lower at pH values below the **protein**'s isoelectric point, at which the emulsion droplets were positively charged, compared with that at pH values above the **protein**'s isoelectric point, at which the emulsion droplets were negatively charged. This effect was mainly a result of the ability of positively charged emulsion droplets to repel cationic iron. The order of oxidative stability of **whey protein isolate**, sweet **whey**, beta-**lactoglobulin**, and alpha-**lactalbumin** is given. The authors conclude that emulsions with greater oxidative stability could be produced using proteins as emulsifiers, thereby reducing or eliminating the need for exogenous food antioxidants, and that this technology could increase the application of oils high in omega-3 fatty acids in foods.
SH FATS
CT ALPHA **LACTALBUMIN**; ANTIOXIDANTS; BETA **LACTOGLOBULIN**; EMULSIONS; FATTY ACIDS; FISH OILS; **LACTALBUMIN**; **LACTOGLOBULIN**; LIPIDS; MARINE OILS; MILK PROTEINS; OIL IN WATER EMULSION; OILS; OMEGA 3 FATTY ACIDS; OXIDATION; POLYUNSATURATED FATTY ACIDS; PROTEINS; STABILITY; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS
DED 25 Mar 2003

L8 ANSWER 110 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 601763 FROSTI
TI Effect of temperature on **whey protein** isolated (WPI) films adsorbed at the water-oil interface.
AU Rodriguez Nino M.; Carrera Sanchez C.; Rodriguez-Patino J.M.
SO Grasas y Aceites, 2002, (July-September), 53 (3), 340-351 (30 ref.)
DT Journal
LA Spanish
SL English; Spanish
AB The heat-induced interfacial aggregation of a **whey protein isolate** (WPI) having a high content of beta-**lactoglobulin** was studied using interfacial dynamic characteristics. The interfacial tension and surface dilational properties were determined in an automatic drop tensiometer coupled with microscopic observation and image analysis. The influence of temperature (20-80 C) and **protein** concentration was examined. The viscoelastic behaviour of the films is discussed. The time-dependence of the surface dilational modulus can be quantified by a first-order equation according to two kinetic mechanisms. The rate of thermal changes in the WPI adsorbed films increased with **protein** concentration in solution. The heat treatment produced irreversible changes in WPI adsorbed films.
SH PROTEINS
CT AGGREGATION; HEAT PROCESSING; HEAT TREATMENT; INTERFACES; KINETICS; PROCESSING; **PROTEIN**; RHEOLOGICAL PROPERTIES; SURFACE TENSION; VISCOELASTICITY; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**; **WHEY PROTEIN**

ISOLATE FILMS
DED 4 Feb 2003

L8 ANSWER 111 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 595820 FROSTI
TI Principal component similarity analysis of Raman spectra to study the effects of pH, heating, and kappa-carrageenan on **whey protein** structure.
AU Alizadeh-Pasdar N.; Nakai S.; Li-Chan E.C.Y.
SO Journal of Agricultural and Food Chemistry, 2002, (October 9), 50 (21), 6042-6052 (55 ref.)
DT Journal
LA English
SL English
AB **Whey protein** ingredients are used for their foaming, emulsifying and gelation properties. Raman spectroscopy was used to study the structural changes of beta-**lactoglobulin**, **whey-protein isolate**, and bovine serum albumin as a function of pH (5-9), heating (at 80 C for 30 minutes) and the presence of kappa-carrageenan (KCG). The results were analysed using analysis of variance, principal component analysis and principal component similarity analysis. Heating and the interaction of heating with KCG were the most important factors influencing the structure of **whey** proteins.
SH PROTEINS
CT FACTORS AFFECTING; HEATING; KAPPA CARRAGEENAN; MOLECULAR STRUCTURE; PH; PRINCIPAL COMPONENT ANALYSIS; RAMAN SPECTROSCOPY; **WHEY** PROTEINS
DED 19 Nov 2002

L8 ANSWER 112 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 594702 FROSTI
TI Expanding the frontiers in separation technology.
AU Nielsen W.K.; Olander M.A.; Lihme A.
SO Scandinavian Dairy Information, 2002, (September), (2), 50-52 (0 ref.)
Published by: Scandinavian Dairy Information, Danish Dairy Board. Address: Frederiks Alle 22, DK-8000 Aarhus, Denmark. Telephone: +45 (8731) 2000. Fax: +45 (8731) 2001. Email: sdi@mejeri.dk Web: www.scandinavian-dairy.com
ISSN: 1101-2706
DT Journal
LA English
AB Development of new markets for specific **whey** components has created demand for new separation technologies that can operate safely in the dairy industry environment. New chromatographic methods are seen to offer a variety of options for production of **whey protein** fractions. Expanded Bed Adsorption (EBA) technology is considered to provide significant advantages compared with other industrial chromatographic processes in terms of production robustness, flexibility and economy. The adsorbent media is allowed to expand inside the column when upward flow of liquid is applied, bringing the adsorbent media into a fluidized state. This results in free passage of particulate impurities in the feed stream through the column system. In the EBA, column there is free open space around the adsorbent media particles during operation. This chromatographic process provides important flexibility in production of **whey protein** derivatives, since the same equipment can be used for production of **whey protein isolate** and alpha-**lactalbumin**. A specifically tailored adsorbent has been developed for each process option. Production of **whey protein isolate**, alpha-**lactalbumin**, lactoferrin and lactoperoxidase, and beta-**lactoglobulin**, immunoglobulins and alpha-**lactalbumin** is discussed. Key advantages of EBA technology are summarized.
SH DAIRY PRODUCTS

CT ADSORPTION CHROMATOGRAPHY; ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; CHROMATOGRAPHY; DAIRY PRODUCTS; ENZYMES; EXPANDED BED ADSORPTION CHROMATOGRAPHY; EXTRACTION; IMMUNOGLOBULINS; **LACTALBUMIN**; LACTOFERRIN; **LACTOGLOBULIN**; LACTOPEROXIDASE; MILK PROTEINS; PRODUCTION; PROTEINS; SEPARATION; **WHEY** PRODUCTS; **WHEY PROTEIN ISOLATE** ; **WHEY** PROTEINS
DED 5 Nov 2002

L8 ANSWER 113 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 594099 FROSTI
TI Viscous properties of taro flour extruded with **whey** proteins to simulate weaning foods.
AU Onwulata C.I.; Konstance R.P.
SO Journal of Food Processing and Preservation, 2002, (August), 26 (3), 179-194 (25 ref.)
Published by: Food & Nutrition Press, Inc. Address: 6527 Main Street, PO Box 374, Trumbull, CT 06611, USA. Telephone: +1 (203) 261 8587. Fax: +1 (203) 261 9724. Email: 72400.3517@compuserve.com Web: www.nysaes.cornell.edu/fst/faculty/acree/staff/chen/IFT/Food_Nut_Press.html
ISSN: 0145-8892
DT Journal
LA English
SL English
AB Taro (Colocasia esculenta) is a tropical root crop and a source of starch, dietary fibre and gums. Taro flour combined with **milk protein** can be used as a weaning food. The effects of **whey protein isolate** (WPI), **whey protein concentrate** (WPC) and **lactalbumin** (LAC) on the texture, water absorption, solubility and viscosity of extruded simulated weaning foods were studied. Before extrusion taro alone had a greater viscosity than taro with WPI, WPC or LAC. Extrudate melt temperature was correlated with extrudate breaking strength and viscosity. Taro and taro with WPC were drier than taro with LAC or WPI extrudates. The taro plus WPI extrudate expanded the most. Ground extrudates were easily rehydrated into pastes. Taro with WPC was the thickest of the simulated weaning foods.
SH CONVENIENCE FOODS
CT DAIRY PRODUCTS; EXTRUDED FOODS; INFANT FOODS; **LACTALBUMIN**; **MILK PROTEIN**; **MILK** PROTEINS; **PROTEIN** ; PROTEINS; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; TARO; TROPICAL VEGETABLES; VEGETABLES; VISCOSITY; WEANING FOODS; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**
DED 25 Oct 2002

L8 ANSWER 114 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 590392 FROSTI
TI Physical and chemical interactions in cold gelation of food proteins.
AU Alting A.C.; de Jongh H.H.J.; Visschers R.W.; Simons J.-W.F.A.
SO Journal of Agricultural and Food Chemistry, 2002, (July 31), 50 (16), 4682-4689 (28 ref.)
Published by: American Chemical Society. Address: 2540 Olentangy River Road, PO Box 3330, Columbus, OH 43210, USA. Telephone: +1 (614) 447 3665. Fax: +1 (614) 447 3745. Email: acsproof@acs.org Web: http://pubs.acs.org/jafc
ISSN: 0021-8561
DT Journal
LA English
SL English
AB Physical and chemical interactions were studied in the cold gelation of

food proteins. Cold gelation allows the introduction of gel structures into foods without the need for heating. **Protein** aggregates were formed by heat treatment, and gelation was established at ambient temperature by gradually reducing the pH. Succinylation of primary amino groups produced beta-**lactoglobulin** aggregates with a decreased isoelectric point, which significantly affected the kinetics of pH-induced gelation. The pH of gelation fell from 5 to about 2.5. Increasing the isoelectric point of beta-**lactoglobulin** by esterification induced gelation at alkaline pH. Comparable results were obtained with **whey protein** isolates. Disulfide bond formation between aggregates was not observed during low-pH gelation. The net electric charge of the aggregates is important in pH-induced gelation.

SH PROTEINS

CT AGGREGATION; BETA **LACTOGLOBULIN**; COLD GELATION; GELATION; ISOELECTRIC POINT; **LACTOGLOBULIN**; MILK PROTEINS; PROCESSING; PROTEINS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS

DED 27 Aug 2002

L8 ANSWER 115 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 590023 FROSTI

TI Effects of sucrose and sorbitol on the gel formation of a **whey protein isolate**.

AU Dierckx S.; Huyghebaert A.

SO Food Hydrocolloids, 2002, (September), 16 (5), 489-497 (30 ref.) Published by: Elsevier Science. Address: PO Box 211, 1000 AE Amsterdam, The Netherlands. Telephone: +31 (20) 485 3757. Fax: +31 (20) 485 3432. Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/foodhyd ISSN: 0268-005X

DT Journal

LA English

SL English

AB **Whey protein isolate** (WPI) is widely used as a food additive, and has a high **protein** content (at least 90%). Sucrose and sorbitol are known to affect **protein** denaturation in food systems. Gelation of WPI may be important in production of biscuits and cakes, for which starch gelatinization should be in a required temperature range for optimal product texture. These effects were studied by differential scanning calorimetry and dynamic rheological measurements in aqueous solution at pH 6.0 and 8.5. The findings suggest that sucrose and sorbitol increase the transition temperature for gelation, and that interactions between **whey** proteins (mostly beta-**lactoglobulin**) and these polyhydric solutes are weak. The gelation mechanism of **whey** proteins showed differences at the two pH values studied. This may be because sucrose and sorbitol modify **protein-protein** interactions in gels by enhancement of hydrophobic interactions.

SH PROTEINS

CT ANALYTICAL TECHNIQUES; CALORIMETRY; CARBOHYDRATES; DSC; EMULSIFIERS; FUNCTIONAL PROPERTIES; GELATION; GELS; HUMECTANTS; INTERACTIONS; **PROTEIN**; **PROTEIN** GELS; **PROTEIN** ISOLATES; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; SORBITOL; SUCROSE; SUGARS; SURFACTANTS; SWEETENERS; TEMPERATURE; TEXTURE; **WHEY PROTEIN ISOLATE**

DED 22 Aug 2002

L8 ANSWER 116 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 584411 FROSTI

TI Exchange reactions between **whey** proteins and caseins in heated soya oil-in-water emulsion systems - overall aspects of the reaction.

AU Dalgleish D.G.; Goff H.D.; Brun J.M.; Luan B.

SO Food Hydrocolloids, 2002, (July), 16 (4), 303-311 (27 ref.)

Published by: Elsevier Science Address: PO Box 211, 1000 AE Amsterdam, The Netherlands Telephone: +31 (20) 485 3757 Fax: +31 (20) 485 3432 Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/foodhyd
ISSN: 0268-005X
DT Journal
LA English
SL English
AB It has been demonstrated using simple model systems that competitive absorption occurs at the interface of oil-in-water emulsions stabilized by milk proteins. This paper provides detailed descriptions of the heat-induced displacement of caseins by proteins from **whey protein isolate** on the surface of oil droplets. Beta-**lactoglobulin** and alpha-**lactalbumin** displaced mainly alpha-s1-casein, and some beta-casein, but not the alpha-s2- and kappa-caseins, at rates dependent on temperature - almost undetectable at ambient temperature, but complete within 2 minutes at 80 C. The extent to which the caseins were displaced also depended on temperature and, to a limited extent, pH, but not ionic strength or sulfydryl exchange reactions. The authors conclude that the exchange reaction is complex, and not governed simply by equilibrium processes between adsorbed and non-adsorbed proteins.
SH PROTEINS
CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; CASEIN; EMULSIONS; **LACTALBUMIN**; **LACTOGLOBULIN**; MILK PROTEINS; OIL IN WATER EMULSION; OIL INTERFACES; PROTEINS; **WHEY** PROTEINS
DED 28 Jun 2002

L8 ANSWER 117 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 584410 FROSTI
TI Exchange reactions between **whey** proteins and caseins in heated soya oil-in-water emulsion systems - behaviour of individual proteins.
AU Dalgleish D.G.; Goff H.D.; Luan B.
SO Food Hydrocolloids, 2002, (July), 16 (4), 295-302 (19 ref.)
Published by: Elsevier Science Address: PO Box 211, 1000 AE Amsterdam, The Netherlands Telephone: +31 (20) 485 3757 Fax: +31 (20) 485 3432 Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/foodhyd
ISSN: 0268-005X
DT Journal
LA English
SL English
AB It has been shown that oil-in-water emulsions prepared using commercial sodium caseinate are modified when heated in the presence of commercial **whey protein isolate**, caseins being displaced by **whey** proteins from emulsion surfaces. To investigate whether different **whey** proteins and caseins behave in different ways, further experiments have been carried out using specific purified **protein** fractions (kappa-, beta- and alpha-s1-caseins, alpha-**lactalbumin** and beta-**lactoglobulin**). The results showed beta-**lactoglobulin** (BLG) to be mostly responsible for the displacement of caseins from the emulsion interface, alpha-**lactalbumin** tending to adsorb without displacing caseins. Significant differences were observed between whole caseinate and the purified fractions, BLG binding strongly to purified kappa-casein emulsions without displacing the casein, possibly as a result of kappa-casein polymerizing at the interface. Disulfide-bond formation between proteins is not the driving force of displacement, but may define the structure of the complexes formed.
SH PROTEINS
CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; CASEIN; CASEINATES; DAIRY PRODUCTS; EMULSIONS; KAPPA CASEIN; **LACTALBUMIN**; **LACTOGLOBULIN**; MILK **PROTEIN**; MILK PROTEINS; OIL IN WATER EMULSION; OIL INTERFACES; **PROTEIN**; PROTEINS; SODIUM CASEINATE; **WHEY** PROTEINS

DED 28 Jun 2002

L8 ANSWER 118 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 581885 FROSTI
TI Process for recovering proteins from **whey protein** containing feedstocks.
IN Ayers J.S.; Elgar D.F.; Palmano K.P.; Pritchard M.
PA New Zealand Dairy Board; Massey University
SO PCT Patent Application
PI WO 2002028194 A1
AI 20011005
PRAI New Zealand 20001005; 20010608
DT Patent
LA English
SL English
AB Details are given of a method for producing a caseino-macropeptide (CMP) **isolate** and an acid- and heat-stable beta-**lactoglobulin** -enriched **whey protein isolate** from a feedstock containing **whey** proteins, CMP and beta-**lactoglobulin**. CMP and beta-**lactoglobulin** are adsorbed from the feedstock by an anion exchanger and then eluted. The eluate is treated with a second anion exchanger under conditions whereby CMP is selectively adsorbed.
SH FUNCTIONAL FOODS
CT ANION EXCHANGE; BETA **LACTOGLOBULIN**; CASEINO MACROPEPTIDE; DAIRY PRODUCTS; ION EXCHANGE; **LACTOGLOBULIN**; MILK **PROTEIN**; MILK PROTEINS; PATENT; PCT PATENT; **PROTEIN**; PROTEINS; **WHEY PROTEIN**
DED 14 May 2002

L8 ANSWER 119 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 579789 FROSTI
TI Tensile and barrier properties of edible films made from **whey** proteins.
AU Fang Y.; Tung M.A.; Britt I.J.; Yada S.; Dalgleish D.G.
SO Journal of Food Science, 2002, (January-February), 67 (1), 188-193 (26 ref.)
Published by: Institute of Food Technologists Address: 221 N. LaSalle Street, Suite 300, Chicago, IL 60601-1291, USA Telephone: +1 (312) 782 8424 Fax: +1 (312) 782 8348 Email: info@ift.org Web: www.ift.org/resource/publ/jfs
ISSN: 0022-1147
DT Journal
LA English
SL English
AB Edible biopolymers films are of considerable interest as biodegradable packaging and barrier films for foods. Calcium has been shown to affect both the structure and the strength of **whey protein** gels, but little is known about the effects of different ions on these films. The tensile strength, elongation and barrier properties of **whey protein isolate** (WPI) films, prepared using a film-forming stage of heat-induced gelation, were therefore investigated. The effects of calcium, **whey protein** ratios, glycerol as plasticizer and emulsion droplet incorporation on the properties were determined. Water vapour permeability, light transmission and film microstructure were also measured. Glycerol and calcium concentrations had a greater effect on the tensile strength, elongation and water vapour permeability than did the beta-**lactoglobulin** concentration. **Protein** crosslinking through the addition of calcium ion improved tensile properties but had little influence on water vapour barrier properties of the WPI films.
SH ADDITIVES
CT BARRIER PROPERTIES; CALCIUM; CALCIUM IONS; EDIBLE FILMS; ELONGATION;

EMULSIFIERS; EMULSION DROPLETS; GLYCEROL; HEAT INDUCED GELATION; MICROSTRUCTURE; MINERALS; PHYSICAL PROPERTIES; **PROTEIN** CROSSLINKING; RHEOLOGICAL PROPERTIES; STRUCTURE; SURFACTANTS; TENSILE STRENGTH; WATER VAPOUR BARRIER PROPERTIES; **WHEY PROTEIN ISOLATE**; **WHEY PROTEIN ISOLATE** FILMS

DED 22 Apr 2002

L8 ANSWER 120 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 574526 FROSTI

TI Rheology, texture and microstructure of **whey** proteins/low methoxy pectins mixed gels with added calcium.

AU Beaulieu M.; Turgeon S.L.; Doublier J.-L.

SO International Dairy Journal, 2001, 11 (11-12), 961-967 (30 ref.)
Published by: Elsevier Science Address: PO Box 211, 1000 AE Amsterdam, The Netherlands Telephone: +31 (20) 485 3757 Fax: +31 (20) 485 3432 Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/idairyj
ISSN: 0958-6946

DT Journal

LA English

SL English

AB Gelation is an important functional property of **whey** proteins, especially beta-**lactoglobulin**. However, there is little information about the interaction of pectins with **whey** proteins in mixed gel systems. The gelation of a **whey protein isolate** mixed with various industrial low-methoxy pectins was investigated. Heat treatment at 80 C was used to induce **whey protein** gelation. The effects of added calcium (0, 5 and 10 mM) on ternary mixtures of **whey protein isolate** , low-methoxy pectins with different degrees of methoxylation and water were studied. Appearance, texture, rheology and microstructure of the formed gels were characterized. The type and proportion of pectin and the calcium concentration affected gel hardness, with increasing pectin and calcium concentrations increasing the firmness of the mixed gels. Competition for hydration and calcium partition between the two phases seemed to be an intrinsic part of the gelation process.

SH PROTEINS

CT CALCIUM; FIRMNESS; GELATION; GELLING AGENTS; LOW METHOXY PECTIN; METHOXYLATION; MICROSTRUCTURE; MILK PROTEINS; MINERALS; MIXED GELS; PECTIN; PHYSICAL PROPERTIES; PROTEINS; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; STRUCTURE; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**

DED 7 Feb 2002

L8 ANSWER 121 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 572837 FROSTI

TI Studies of the binding of alpha-**lactalbumin** to immobilized peptide ligands.

AU Gurgel P.V.; Carbonell R.G.; Swaisgood H.E.

SO Journal of Agricultural and Food Chemistry, 2001, (December), 49 (12), 5765-5770 (20 ref.)
Published by: American Chemical Society Address: 2540 Olentangy River Road, PO Box 3330, Columbus. OH 43210, USA Telephone: +1 (614) 447 3665 Fax: +1 (614) 447 3745 Email: acsproof@acs.org Web: http://pubs.acs.org/jafc
ISSN: 0021-8561

DT Journal

LA English

SL English

AB Alpha-**lactalbumin** is a major **protein** present in **whey**. The mechanism of binding of alpha-**lactalbumin** to the peptide ligand WHWRKR and its variants HWRKR and acetylated WHWRKR immobilized on a polymethacrylate resin was studied. There were at least three distinct mechanisms of binding. Two were temperature-dependent and

one was temperature-independent. The same behaviour was observed for **whey-protein isolate**. Lysozyme showed little or no binding to the resins.

SH PROTEINS

CT ALPHA **LACTALBUMIN**; BINDING; **LACTALBUMIN**; LIGANDS; MECHANISMS; MILK PROTEINS; PEPTIDES; PROTEINS

DED 22 Jan 2002

L8 ANSWER 122 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 571202 FROSTI

TI Spreading the health.

AU Frank P.

SO Dairy Field, 2001, (September), 184 (9), 57-63 (0 ref.)
Published by: Stagnito Communications Inc. Address: 1935 Shermer Road, Suite 100, Northbrook, IL 60062-5354, USA. Telephone: +1 (847) 205 5660. Fax: +1 (847) 205 5680. Web: www.dairyfield.com
ISSN: 1055-0607

DT Journal

LA English

AB The natural health benefits of dairy foods might be increased by utilization of functional ingredients and nutritional fortification. Components of dairy products, including vitamins, minerals, oligosaccharides, sphingolipids, conjugated linoleic acid, **whey protein** and alpha-**lactalbumin**, have been found to have physiological effects. **Milk** products are known to be good sources of complex sphingolipids, which have been linked with prevention of colon cancer. **Whey** proteins consist of **whey protein concentrate** and **whey protein isolate** (WPI). Isolation of WPI proteins by microfiltration produces macropeptides, bioactive proteins that bind to cells in the gut and result in appetite suppression. Lactoferrin is a naturally biologically active **protein** isolated from **whey** that reportedly modulates immune response and has anti-pathogenic effects in the gastrointestinal tract. Fortification of **milk** with vitamins and minerals such as calcium has created problems involving mouthfeel, taste, aroma and solubility, while minerals might interact, causing shelf life issues. Fermented **milk** and yoghurt contain probiotics, live microbial cultures, which beneficially affect the microflora balance in the gastrointestinal tract while providing protection against pathogens. Encapsulation has been used to protect probiotics from moisture, high humidity and acidity. The fructooligosaccharide inulin is a soluble dietary fibre that has application as a prebiotic stimulant of probiotic bacteria.

CT COMPOSITION; DAIRY PRODUCTS; FORTIFICATION; FUNCTIONAL INGREDIENTS; HEALTH BENEFITS; INGREDIENTS; INULIN; LACTOFERRIN; LIPIDS; **MILK**; **MILK PROTEIN**; MINERALS; PREBIOTICS; PROBIOTICS; **PROTEIN**; SPHINGOLIPIDS; VITAMINS; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**

DED 19 Dec 2001

L8 ANSWER 123 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 564728 FROSTI

TI Pressure-induced denaturation of monomer beta-**lactoglobulin** is partially irreversible: comparison of monomer form (highly acidic pH) with dimer form (neutral pH).

AU Ikeuchi Y.; Nakagawa K.; Endo T.; Suzuki A.; Hayashi T.; Ito T.

SO Journal of Agricultural and Food Chemistry, 2001, (August), 49 (8), 4052-4059 (29 ref.)
Published by: American Chemical Society Address: 2540 Olentangy River Road, PO Box 3330, Columbus. OH 43210, USA Telephone: +1 (614) 447 3665 Fax: +1 (614) 447 3745 Email: acsproof@acs.org Web: http://pubs.acs.org/jafc

ISSN: 0021-8561
DT Journal
LA English
SL English
AB The properties of pressure-induced **whey protein isolate** (WPI) gels are influenced by the changes in the properties of beta-**lactoglobulin** (Blg). The effects of high hydrostatic pressure on monomer Blg at acid pH were studied by fluorescence spectroscopy under pressure and by circular dichroism and proton NMR spectroscopy after pressure release. The results indicated that the pressure-induced denaturation of Blg at pH 2 was reversible. Pressurized Blg lost its ability to bind cis-parinaric acid but not its ability to bind retinol. At neutral pH, Blg denatured irreversibly. The Blg content of WPI may be responsible for the pH dependency of the gel-forming ability of pressurized WPI.
SH PROTEINS
CT BETA **LACTOGLOBULIN**; CHEMICAL PROPERTIES; DEGRADATION; DENATURATION; HIGH PRESSURE; **LACTOGLOBULIN**; MILK PROTEINS; PH; PROTEINS; **WHEY PROTEIN ISOLATE**
DED 5 Oct 2001

L8 ANSWER 124 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 564252 FROSTI
TI Rheological characterization of a gel formed during extensive enzymatic hydrolysis.
AU Doucet D.; Gauthier S.F.; Foegeding E.A.
SO Journal of Food Science, 2001, (June-July), 66 (5), 711-715 (36 ref.) Published by: Institute of Food Technologists. Address: 221 N. LaSalle Street, Suite 300, Chicago, IL 60601-1291, USA. Telephone: +1 (312) 782 8424. Fax: +1 (312) 782 0045. Email: info@ift.org Web: www.ift.org/resource/publ/jfs/jfs.shtml
ISSN: 0022-1147
DT Journal
LA English
SL English
AB The nutritional and functional properties of **whey** proteins mean they are used extensively within the food industry. At higher temperatures, the major component of the proteins, beta-**lactoglobulin**, denatures and forms insoluble aggregates. This limits their use in pasteurized foods. Limited hydrolysis with Bacillus licheniformis proteinase can induce **whey protein isolate** gelation. The effects of extensive hydrolysis by Alcalase 2.4L on enzyme-induced gelation of **whey protein** isolates were investigated. The extensive hydrolysis increased turbidity and viscosity and led to formation of a gel. The gels remain stable over a wide range of temperatures. The interactions involved in the formation remain unclear.
SH PROTEINS
CT DEGRADATION; DENATURATION; ENZYMES; GELS; HYDROLYSIS; **PROTEIN** GELS; PROTEINASES; RHEOLOGICAL PROPERTIES; **WHEY PROTEIN** ; **WHEY PROTEIN** ISOLATES
DED 28 Sep 2001

L8 ANSWER 125 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 563209 FROSTI
TI Putting proteins to work.
AU Decker K.J.
SO Food Product Design, 2001, (June), 11 (3), 39-60 (14pp) (0 ref.) Published by: Weeks Publishing Co. Address: 3400 Dundee Road, Suite 100, Northbrook, IL 60062-2333, USA Telephone: +1 (847) 559 0385 Fax: +1 (847) 559 0389 Email: weeksfpd@aol.com Web: www.foodproductdesign.com
ISSN: 1065-772X
DT Journal

LA English
AB Functional proteins are used to increase the nutrition, taste, appearance and performance of food products. **Milk** contains two main **protein** categories, caseins and **whey** proteins. Acid-precipitated casein is made more soluble by addition of hydroxides to casein solution and increasing pH, resulting in soluble caseinates that are dried to a powder and used in coffee whiteners. Caseinates are able to bind moisture and meat particles in meat products, contributing to a smoother, richer mouthfeel. Caseinates stabilize foam in bread and add dairy flavour. Mineral/caseinate interactions cause problems in product development. **Whey** proteins produced as by-products of cheesemaking can be subdivided into smaller peptide constituents, alpha-**lactalbumin** and beta-**lactoglobulin** showing bioactive health benefits. Production, utilization and functional properties of **whey protein concentrate** and **whey protein isolate** as high-quality **protein** ingredients are discussed. Egg proteins comprise albumen and yolk proteins. Functional properties and applications of albumen proteins such as ovalbumin and ovotransferrin are described. Functional properties and applications of functional proteins in soya accessed via soya flour and grits, soya **protein** concentrates, and isolated soya proteins are detailed. Wheat proteins present in wheat flour are currently commercially available as wheat **protein isolate**, textured wheat **protein**, hydrolysed wheat **protein**, wheat gliadin, and wheat glutenin.
SH PROTEINS
CT APPLICATIONS; BASIC GUIDE; CASEINATES; CEREAL PROTEINS; DAIRY PRODUCTS; EGG PROTEINS; FUNCTIONAL PROPERTIES; INGREDIENTS; **MILK PROTEIN**; **MILK** PROTEINS; PRODUCTION; **PROTEIN**; PROTEINS; SOYA PROTEINS; VEGETABLE PROTEINS; WHEAT PROTEINS; **WHEY** PROTEINS
DED 18 Sep 2001

L8 ANSWER 126 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 562381 FROSTI
TI Molecular self-assembly of partially hydrolysed alpha-**lactalbumin** resulting in strong gels with a novel microstructure.
AU Ipsen R.; Otte J.; Qvist K.B.
SO Journal of Dairy Research, 2001, (May), 68 (2), 277-286 (26 ref.) Published by: Cambridge University Press Address: The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU Telephone: +44 (1223) 325806 Fax: +44 (1223) 315052 Email: journals_marketing@cup.cam.ac.uk Web: www.cup.cam.ac.uk or www.journals.cup.org ISSN: 0022-0299
DT Journal
LA English
SL English
AB A serine proteinase isolated from Bacillus licheniformis (BLP) has been shown to induce aggregation and gelation in **whey protein isolate** and beta-**lactoglobulin**. Although the proteinase-induced gelation seems to be dominated by the actions of the enzyme on beta-**lactoglobulin**, improved gel formation has been observed using pure alpha-**lactalbumin** as substrate. The rheological and microstructural characteristics of gels formed by the action of BLP on a purified alpha-**lactalbumin** preparation were therefore investigated. Gelation of alpha-**lactalbumin** incubated with BLP at 50 C for 4 hours was monitored from shear and deformation properties characterized by uniaxial compression. The microstructure was examined by transmission electron microscopy and found to be non-branching, hollow strands with a uniform diameter around 20 nm, similar to microtubules. The addition of calcium ions changed the spatial distribution of the strands, reducing the failure stress, but essential for gel formation. A mechanism is proposed

for the self-assembly of the partially hydrolysed alpha-**lactalbumin** into long tubes. Proteolysis of alpha-**lactalbumin** with BLP in the presence of calcium ions results in the formation of a strong gel with a microtubular structure.

SH DAIRY PRODUCTS

CT AGGREGATION; ALPHA **LACTALBUMIN**; BACILLUS; BACILLUS LICHENIFORMIS; BACTERIA; BACTERIAL ENZYMES; BACTERIAL PROTEINASES; CALCIUM; CALCIUM IONS; COMPRESSION PROPERTIES; DEGRADATION; ENZYMES; GELATION; GELS; **LACTALBUMIN**; MICROBIAL ENZYMES; MICROBIAL PROTEINASES; MICROORGANISMS; MICROSTRUCTURE; MILK PROTEINS; MINERALS; **PROTEIN** GELS; PROTEINASES; PROTEINS; PROTEOLYSIS; RHEOLOGICAL PROPERTIES; STRUCTURE

DED 11 Sep 2001

L8 ANSWER 127 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 561924 FROSTI

TI New biological function of bovine alpha-**lactalbumin**: protective effect against ethanol- and stress-induced gastric mucosal injury in rats.

AU Matsumoto H.; Shimokawa Y.; Ushida Y.; Toida T.; Hayasawa H.

SO Bioscience, Biotechnology, and Biochemistry, 2001, (May), 65 (5), 1104-1111 (35 ref.)
Published by: Japan Society for Bioscience, Biotechnology and Agrochemistry (Nippon Nogeikagaku Kai). Address: Japan Academic Societies Center Building, 2-4-16, Yayoi, Bunkyo-ku, Tokyo 113-0032, Japan. Fax: +81 (3) 3815 1920. Web: wwwsoc.nacsis.ac.jp/jsbba
ISSN: 0916-8451

DT Journal

LA English

AB Bovine alpha-**lactalbumin** protected against ethanol- and stress-induced gastric mucosal injury in rats. Acute ulcers were induced in male Wistar rats (11 weeks old) using either 60% ethanol-HCl or water-immersion restraint stress (23 C for 7 hours). Alpha-**lactalbumin** protected against ethanol-induced injury, whilst casein had no effect. **Whey protein isolate** also protected against gastric injury, but this was due to the alpha-**lactalbumin** in the **isolate**. Pretreatment with indomethacin reduced the protective effect of alpha-**lactalbumin** . Milk is known to be effective in preventing ulcers. Alpha-**lactalbumin** appears to be the active component of cow milk **protein**, and may protect against gastric mucosal injury through endogenous prostaglandin synthesis.

SH DAIRY PRODUCTS

CT ALCOHOLS; ALPHA **LACTALBUMIN**; BOVINE ALPHA **LACTALBUMIN** ; DAIRY PRODUCTS; ETHANOL; GASTRIC MUCOSAL INJURY; GASTRIC ULCERS; HEALTH; **LACTALBUMIN**; MILK PROTEINS; PROTEINS; PSYCHOLOGICAL STRESS; ULCERS

DED 4 Sep 2001

L8 ANSWER 128 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 560935 FROSTI

TI Fractionation of high-value **whey** proteins.

AU Olander M.A.; Lund Jakobsen U.; Bendix Hansen M.; Lihme A.

SO Scandinavian Dairy Information, 2001, (June), (2), 18-21 (0 ref.)
Published by: Scandinavian Dairy Information, Danish Dairy Board Address: Frederiks Alle 22, DK-8000 Aarhus, Denmark Telephone: +45 (8731) 2000 Fax: +45 (8731) 2001 Email: sdi@mejeri.dk Web: www.scandinavian-dairy.com
ISSN: 1101-2706

DT Journal

LA English

AB **Whey protein** concentrates (WPCs) and **whey protein** isolates (WPIs) may be obtained by membrane filtration

techniques and fractionation. This article discusses the use of the separation technology Expanded Bed Adsorption (EBA), developed by Danish company Upfront Chromatography. The method may be used with non-clarified feedstocks. **Whey** that contains fines may be applied directly to the chromatographic column without causing clogging, with reduction of overall process costs. The authors outline the operation of the EBA process, and consider process integration, modular process design, and production estimates. EBA may be used for production of beta-**lactoglobulin**, alpha-**lactalbumin**, lactoferrin, lactoperoxidase, bovine serum albumin, immunoglobulin, glycomacropeptide, and casein phosphopeptide (CPP).

SH PROTEINS

CT ADSORPTION CHROMATOGRAPHY; APPLICATIONS; CHROMATOGRAPHY; DAIRY PRODUCTS; EXPANDED BED ABSORPTION; EXTRACTION; FRACTIONATION; MANUFACTURERS; **MILK PROTEIN**; **MILK** PROTEINS; **PROTEIN** ; PROTEINS; SEPARATION; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS

DED 17 Aug 2001

L8 ANSWER 129 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 556141 FROSTI

TI Application of PRODAN fluorescent probe to measure surface hydrophobicity of proteins interacting with kappa-carrageenan.

AU Alizadeh-Pasdar N.; Li-Chan E.C.Y.

SO Food Hydrocolloids, 2001, (May), 15 (3), 285-294 (48 ref.)
Published by: Elsevier Science Address: PO Box 211, 1000 AE Amsterdam, The Netherlands Telephone: +31 (20) 485 3757 Fax: +31 (20) 485 3432 Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/foodhyd
ISSN: 0268-005X

DT Journal

LA English

SL English

AB A simple and reliable probe to monitor changes in **protein** surface hydrophobicity could provide valuable information regarding interactions between polysaccharides and proteins. This paper describes the use of the fluorescent probe, 6-propionyl-2-(N-N-dimethylamino)-naphthalene (PRODAN), to measure the surface hydrophobicity (SH) of **whey protein isolate**, beta-**lactoglobulin**, and bovine serum albumin interacting with kappa-carrageenan (KCG). The effects of heating (80 C for 30 minutes), pH (3.0, 5.0, 7.0 and 9.0) and KCG:**protein** ratio (1:1.2, 1:6, 1:62.5) on SH are discussed. In general, the proteins had higher SH, and were more sensitive to heating and KCG addition at pH 9.0. These authors conclude that PRODAN can be used to monitor changes in surface hydrophobicity resulting from **protein**/kappa-carrageenan interactions under varying pH and heat treatments.

SH ANALYSIS

CT CARBOHYDRATES; CARRAGEENAN; DETERMINATION; FLUORESCENCE; GELLING AGENTS; HYDROPHOBICITY; INTERACTIONS; KAPPA CARRAGEENAN; LUMINESCENCE; POLYSACCHARIDES; PRODAN; PROPERTIES; PROTEINS; SURFACE HYDROPHOBICITY; SURFACE PROPERTIES

DED 21 Jun 2001

L8 ANSWER 130 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 546346 FROSTI

TI Plasticizer effect on oxygen permeability of beta-**lactoglobulin** films.

AU Sothornvit R.; Krochta J.M.

SO Journal of Agricultural and Food Chemistry, 2000, (December), 48 (12), 6298-6302 (22 ref.)
Published by: American Chemical Society Address: 2540 Olentangy River Road, PO Box 3330, Columbus. OH 43210, USA Telephone: +1 (614) 447 3665

Fax: +1 (614) 447 3745 Email: acsproof@acs.org Web: http://pubs.acs.org/jafc
ISSN: 0021-8561
DT Journal
LA English
SL English
AB Little research has been conducted on the effects of different plasticizers on beta-**lactoglobulin** (beta-LG) and **whey -protein-isolate** (WPI) films. A study was conducted to investigate the effects of plasticizer composition, size and shape on beta-LG film oxygen permeability. The plasticizers were propylene glycol (PG), glycerol, sorbitol, polyethylene glycol 200 (PEG 200), polyethylene glycol 400 (PEG 400) and sucrose. Sucrose and sorbitol resulted in films with the best oxygen barriers. PEG 200- and PEG 400-plasticized films were poor oxygen barriers. Platicizer efficiency ratios between mechanical and oxygen permeability properties indicated the relative efficiencies of plasticizers. A large ratio was preferable.
SH PACKAGING
CT BETA **LACTOGLOBULIN**; EDIBLE FILMS; GAS PERMEABILITY; **LACTOGLOBULIN**; MILK PROTEINS; OXYGEN PERMEABILITY; PACKAGING ADDITIVES; PERMEABILITY; PLASTIC ADDITIVES; PLASTICIZERS; PROTEINS
DED 6 Mar 2001

L8 ANSWER 131 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 542580 FROSTI
TI Separation of bovine immunoglobulin G and glycomacropeptide from dairy **whey**.
AU Xu Y.; Sleigh R.; Hourigan J.; Johnson R.
SO Process Biochemistry, 2000, (December), 36 (5), 393-399 (22 ref.)
Published by: Elsevier Science Address: PO Box 211, 1000 AE Amsterdam, The Netherlands Telephone: +31 (20) 485 3757 Fax: +31 (20) 485 3432 Email: nlinfo-f@elsevier.nl Web: www.elsevier.nl/locate/procbio
ISSN: 0032-9592
DT Journal
LA English
SL English
AB A process using a polystyrene anion exchanger (Amberlite IRA93) and a 100-kD molecular weight cut-off membrane (Amicon YM100) to prepare immunoglobulin-enriched products from dairy **whey** by selective removal of major **whey** proteins such as alpha-**lactalbumin**, beta-**lactoglobulin** and bovine serum albumin is described. Products with immunoglobulin G contents of 43.3% and 93% were obtained from HCl-casein **whey** and colostral **whey**, respectively. IRA93 was shown to adsorb glycomacropeptide selectively from cheddar cheese **whey** at pH 4.7. The effects of pH, salt and diafiltration on the ultrafiltration of **whey** proteins are described. It is suggested that the results obtained could be used to design a continuous process for the production of milk immunoglobulins, glycomacropeptide, and **whey-protein isolate** from rennet cheese **whey**.
SH DAIRY PRODUCTS
CT CHEESE **WHEY**; DAIRY PRODUCTS; EXTRACTION; FILTERS; FILTRATION; GLYCOMACROPEPTIDES; IMMUNOGLOBULIN G; IMMUNOGLOBULINS; ION EXCHANGE RESINS; MEMBRANE FILTERS; MILK **PROTEIN**; **PROTEIN**; **PROTEIN** ISOLATES; SEPARATION; ULTRAFILTRATION; **WHEY**; **WHEY PROTEIN**
DED 18 Jan 2001

L8 ANSWER 132 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 542237 FROSTI
TI Effect of partial hydrolysis with an immobilized proteinase on thermal gelation properties of beta-**lactoglobulin** B.
AU Otte J.; Lomholt S.B.; Ipsen R.; Qvist K.B.

SO Journal of Dairy Research, 2000, (November), 67 (4), 597-608 (23 ref.)
Published by: Cambridge University Press Address: The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU Telephone: +44 (1223) 325806 Fax: +44 (1223) 315052 Email: journals_marketing@cup.cam.ac.uk Web: www.cup.cam.ac.uk or www.journals.cup.org
ISSN: 0022-0299
DT Journal
LA English
SL English
AB Partial hydrolysis with a proteinase from Bacillus licheniformis has been shown to affect the microstructure and strength of heat-set **whey -protein-isolate** gels (WPI). It has been suggested that beta-**lactoglobulin** (beta-LG) is responsible for this effect. The influence of partial hydrolysis with an immobilized proteinase from Bacillus licheniformis on the thermal gelation of isolated beta-LG B was studied. The microstructure and water-holding capacity of the gels were examined. With increasing degrees of hydrolysis, the gels become increasingly coarse, with increased permeability and lower water-holding capacity. There was a high correlation between time of hydrolysis, gel structure dimensions, expellable water and proton relaxation times.
SH PROTEINS
CT BACILLUS; BACILLUS LICHENIFORMIS; BACTERIA; BETA **LACTOGLOBULIN**; DEGRADATION; ENZYMES; FUNCTIONAL PROPERTIES; GELATION; GELS; HYDROLYSIS; **LACTOGLOBULIN**; MICROORGANISMS; MICROSTRUCTURE; MILK PROTEINS; PROTEINASES; PROTEINS; **WHEY PROTEIN ISOLATE**
DED 16 Jan 2001

L8 ANSWER 133 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 541593 FROSTI
TI Effects of lipid on **whey protein** gelation.
AU Ikeda S.; Foegeding E.A.
SO Gums and stabilisers for the food industry 10: proceedings of the 10th Conference, Wrexham, July 1999., Published by: RSC, Cambridge, 2000, 366-372 (20 ref.)
Williams P.A.; Phillips G.O.
ISBN: 0-85404-820-0
DT Conference Article
LA English
AB **Whey-protein** isolates (WPIs) and concentrates are used as ingredients to control the quality of food products. A study was conducted to investigate the effects of lipids on heat-induced gelation of **whey** proteins. The fracture properties, water-holding capacity, and small-strain rheological properties of heat-induced WPI gels formed in the presence and absence of lecithin were investigated. Far-UV circular dichroism (CD) was used to study the effects of phosphatidylcholine (PC) and fatty acids in **whey-protein** ingredients on structural changes in beta-**lactoglobulin** during gelation. When phospholipids were added to **whey-protein** dispersions, the heat-induced gels were either stronger or weaker, depending on the ionic concentration.
SH ADDITIVES
CT GELATION; GELS; **LACTOGLOBULIN**; LIPIDS; MECHANICAL PROPERTIES; MILK **PROTEIN**; MILK PROTEINS; **PROTEIN**; PROTEINS; STRUCTURE; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**
DED 5 Jan 2001

L8 ANSWER 134 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 538989 FROSTI
TI Dry **whey** an alternative to gum arabic.
AU Anon.
SO Emerging Food R and D Report, 2000, (February), 10 (11), 5-6 (0 ref.)

ISSN: 1050-2688
DT Journal
LA English
AB This article considers the use of **whey protein isolate** (WPI) as an alternative emulsifier to gum arabic, particularly with reference to beverage formulations. WPI can extend the shelf life of beverages, and might be particularly suitable for infant formulas, fruit-based drinks, and nutritional and sports beverages. Other research on the individual **protein** and mineral components in **whey** are mentioned, including lactoferrin, alpha-**lactalbumin**, and glycomacropeptide; their particular properties and potential applications are discussed.
CT ALPHA **LACTALBUMIN**; BEVERAGES; DAIRY PRODUCTS; EMULSIFIERS; FRUIT DRINKS; FRUIT PRODUCTS; GUM SUBSTITUTES; INFANT FOODS; INFANT FORMULAS; **LACTALBUMIN**; LACTOFERRIN; MILK PROTEINS; **PROTEIN**; **PROTEIN** ISOLATES; PROTEINS; SHELF LIFE; STABILITY; SURFACTANTS; **WHEY**; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**
DED 5 Dec 2000

L8 ANSWER 135 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 538247 FROSTI
TI Cost-effective recovery of **whey** proteins.
AU Nielsen W.K.
SO Scandinavian Dairy Information, 2000, (September), (3), 24-27 (0 ref.) Published by: Scandinavian Dairy Information, Danish Dairy Board Address: Frederiks Alle 22, DK-8000 Aarhus, Denmark Telephone: +45 (8731) 2000 Fax: +45 (8731) 2001 Email: sdi@mejeri.dk Web: www.scandinavian-dairy.com
ISSN: 1101-2706
DT Journal
LA English
AB **Whey** products are considered to have health and nutritional benefits. Products from **whey** processing include **whey** proteins (alpha-**lactalbumin** and beta-**lactoglobulin**), enzymes (e.g. lactoferrin and lactoperoxidase), **whey protein isolate** (WPI) and glycomicropeptides. New applications for these premium products are increasing rapidly. There is much interest in separation technologies for **whey** components. The Sepragen Corporation has developed Sepralac Technology for **whey** separation. The technology involves the use of the radial flow chromatography process with SepraPrep resin. This paper discusses the Sepralac process, process economics, **whey** products produced by the process, market opportunities and the Sepragen business model.
SH PROTEINS
CT CHROMATOGRAPHY; DAIRY PRODUCTS; EXTRACTION; LACTOFERRIN; MILK PROTEINS; NEW PROCESSES; PROTEINS; SEPARATION; **WHEY** PRODUCTS; **WHEY PROTEIN ISOLATE**; **WHEY** PROTEINS
DED 24 Nov 2000

L8 ANSWER 136 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 538011 FROSTI
TI Functional properties of the **whey protein** fractions produced in pilot scale processes. Foaming, water-holding capacity and gelation.
AU Rantamaki P.; Tossavainen O.; Outinen M.; Tupasela T.; Koskela P.; Kaunismaki M.
SO Milchwissenschaft, 2000, (October), 55 (10), 569-572 (23 ref.) Published by: VV-GmbH, Volkswirtschaftlicher Verlag Address: Kederbacher Str. 50, D-81377 Munchen, Germany; Postfach 701920, D-81319, Munchen, Germany Telephone: +49 (89) 714 1013 Fax: +49 (89) 719 2753 Email: vv-verlag@t-online.de Web: www.vv-verlag.de
ISSN: 0026-3788

DT Journal
LA English
SL English
AB **Whey** proteins have a high nutritional value and valuable functional properties. The development of membrane filtration techniques has enabled specific **whey protein** fractions to be produced. Alpha-**lactalbumin** and beta-**lactoglobulin** fractions were prepared using four pilot-scale processes. Their foaming properties, water-holding capacity and gelation of the obtained fractions were compared. The functional properties of the enriched fractions varied with process used. Reasons for the differences are suggested.
SH DAIRY PRODUCTS
CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; BINDING CAPACITY; FOAMING PROPERTIES; FRACTIONATION; FUNCTIONAL PROPERTIES; GELATION; **LACTALBUMIN**; **LACTOGLOBULIN**; MILK PROTEINS; **PROTEIN**; **PROTEIN ISOLATE**; PROTEINS; WATER HOLDING CAPACITY; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**
DED 23 Nov 2000

L8 ANSWER 137 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 537831 FROSTI
TI **Milk** proteins.
AU Ennis M.P.; Mulvihill D.M.
SO Handbook of hydrocolloids., Published by: Woodhead Publishing Ltd, Cambridge, 2000, 189-217 (42 ref.)
Phillips G.O.; Williams P.A.
ISBN: 1-85573-501-6
DT Book Article
LA English
AB **Milk** proteins are useful food additives because of their high nutritional value and functional properties. An overview of **milk** proteins is provided. Consideration is given to the composition of **milk** and the distribution of proteins in **milk**; the manufacture of **milk protein** products (e.g. caseins, caseinates, the fractionation of caseins, **whey** powders and modified **whey** powders, **whey protein concentrate**, **whey protein isolate**, **lactalbumin** and the fractionation of **whey** proteins); functional properties (solubility, gelation, coagulation, hydration, viscosity, and surface active, emulsifying and foaming properties) of **milk protein** products; applications (in bakery products, dairy products, beverages, desserts, pasta products, confectionery, meat products, convenience foods, textured products, films and coatings); and future developments. Tables and figures supplement the text.
SH ADDITIVES
CT APPLICATIONS; CASEIN; CASEINATES; COMPOSITION; DAIRY PRODUCTS; FUNCTIONAL PROPERTIES; HYDROCOLLOIDS; **MILK PROTEIN**; **MILK PROTEIN** PRODUCTS; **MILK** PROTEINS; PRODUCTION; **PROTEIN**; **PROTEIN** PRODUCTS; PROTEINS; REVIEW; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; VISCOSITY; **WHEY** PRODUCTS
DED 23 Nov 2000

L8 ANSWER 138 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 533571 FROSTI
TI Rapid Visco Analysis of dairy ingredients.
AU Haydon R.M.; Hosken R.W.
SO Australian Journal of Dairy Technology, 2000, (June), 55 (2), 89 (2 ref.)
ISSN: 0004-9433
DT Journal
LA English

SL English
AB Unfolding of the milk proteins in dairy products can affect the rheological properties of the food system and thus impact on the consumer acceptance of a dairy product. The Newport Scientific Rapid Visco Analyser was developed to measure the pasting properties of wheat flour and starches. It was used to study a **whey protein isolate** fraction high in beta-**lactoglobulin** content, which is used in gelled foods and desserts. The effects of thermal processing on viscosity of gels containing beta-**lactoglobulin** -enriched **whey protein** fractions were determined. **Whey** and soya **protein** isolates were studied individually and as mixture components.
SH DAIRY PRODUCTS
CT BETA **LACTOGLOBULIN**; DETERMINATION; EVALUATION; FRACTIONS; **LACTOGLOBULIN**; MILK PROTEINS; PASTING PROPERTIES; PROTEINS; RAPID VISCO ANALYSER; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; SOYA PROTEINS; VEGETABLE PROTEINS; VISCOSITY; **WHEY** PROTEINS
DED 3 Oct 2000

L8 ANSWER 139 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 533557 FROSTI
TI Gelation of **whey protein** induced by proteolysis or high pressure treatment.
AU Ipsen R.; Otte J.; Dominguez E.; Qvist K.B.
SO Australian Journal of Dairy Technology, 2000, (June), 55 (2), 49-52 (19 ref.)
ISSN: 0004-9433
DT Journal
LA English
SL English
AB A proteolytic enzyme from Bacillus licheniformis has been found to improve the meltability of cheese. The gelation of unheated and heat-treated **whey protein isolate**, induced by enzymic proteolysis or high-pressure treatment was studied. A combination of heat and proteolysis could allow the production of a range of gels with different rheological and microstructural properties. The influence of pH, salts (calcium chloride or sodium chloride) and temperature on enzyme-induced gelation was determined. The enzyme-induced gelation of mixtures of alpha-**lactalbumin** and beta-**lactoglobulin** was also examined. The high-pressure gelation of **whey** proteins can be adversely affected by the presence of non-incorporated liquid after gelation.
SH DAIRY PRODUCTS
CT BACILLUS; BACILLUS LICHENIFORMIS; CALCIUM CHLORIDE; CALCIUM SALTS; CHEMICAL PROPERTIES; CHLORIDES; DEGRADATION; ENZYMES; GELATION; HIGH PRESSURE; MILK PROTEINS; PH; PROTEINS; PROTEOLYSIS; SALTS; SODIUM CHLORIDE; TEMPERATURE; **WHEY** PROTEINS
DED 3 Oct 2000

L8 ANSWER 140 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 526193 FROSTI
TI Simultaneous separation and quantitation of the major bovine **whey** proteins including proteose peptone and caseinomacropeptide by reversed-phase high-performance liquid chromatography on polystyrene-divinylbenzene.
AU Elgar D.F.; Norris C.S.; Ayers J.S.; Pritchard M.; Otter D.E.; Palmano K.P.
SO Journal of Chromatography A, 2000, 878, 183-196 (41 ref.)
DT Journal
LA English
SL English
AB Improved analytical methods are required for monitoring fractionation of **whey** proteins utilized in value-added products on the basis of

their nutritional and bioactive properties. Development and validation of a precise, sensitive and reliable reversed-phase HPLC method for simultaneous quantitative analysis of bovine **whey** proteins alpha-**lactalbumin**, beta-**lactoglobulin**, bovine serum albumin, proteose peptone, immunoglobulin G and caseinomacropeptide are reported. The optimized method on a Resource RPC column enabled separation of the **whey** proteins in 30 minutes, and might be applied to analysis of soluble proteins in various commercial and laboratory **whey** products. Some qualitative data on **protein** heterogeneity and quality were obtained from reversed-phase HPLC analyses. Within- and between-day repeatability over a wide range of concentrations was found to be good for all proteins except immunoglobulin G and bovine serum albumin. Limits of detection and quantification were obtained by analysis of grouped data from **whey-protein concentrate** and **whey-protein isolate** samples. Quantitative data obtained by the proposed method compared well with data obtained by alternative methods of **whey-protein** analysis.

SH ANALYSIS

CT AGRICULTURAL PRODUCTS; ALBUMINS; ALPHA **LACTALBUMIN**; ANIMALS; BETA **LACTOGLOBULIN**; BOVINE SERUM ALBUMIN; CASEINOMACROPEPTIDE; CATTLE; CHROMATOGRAPHY; DETERMINATION; EXTRACTION; HPLC; IMMUNOGLOBULIN G; IMMUNOGLOBULINS; **LACTALBUMIN**; **LACTOGLOBULIN**; LIQUID CHROMATOGRAPHY; LIVESTOCK; **MILK** PROTEINS; PROTEINS; PROTEOSE PEPTONE; REVERSE PHASE CHROMATOGRAPHY; SEPARATION; SIMULTANEOUS DETERMINATION; **WHEY** PROTEINS

DED 5 Jul 2000

L8 ANSWER 141 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 518792 FROSTI

TI Comparison of **protein** surface hydrophobicity measured at various pH values using three different fluorescent probes.

AU Alizadeh-Pasdar N.; Li-Chan E.C.Y.

SO Journal of Agricultural and Food Chemistry, 2000, (February), 48 (2), 328-334 (51 ref.)
ISSN: 0021-8561

DT Journal

LA English

SL English

AB Hydrophobicity is related to the functional properties of proteins. Three fluorescent probes were compared for determining **protein** surface hydrophobicity. The probes were an uncharged probe based on 6-propionyl-2-(N,N-dimethylamino)-naphthalene or PRODAN), an anionic aliphatic probe (cis-parinaric acid, CPA) and an aromatic probe (1-anilinonaphthalene-8-sulfonic acid, ANS). The surface hydrophobicities of **whey-protein isolate** (WPI), beta-**lactoglobulin** and bovine serum albumin BSA) were determined before and after heating. The three probes gave different results, indicating that the presence or absence of a permanent charge and the aromatic or aliphatic nature of the probes can influence **protein** hydrophobicity values.

SH ANALYSIS

CT DETERMINATION; FLUORESCENCE; HYDROPHOBICITY; LUMINESCENCE; PROBES; PROTEINS

DED 27 Apr 2000

L8 ANSWER 142 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 511264 FROSTI

TI Some physico-chemical properties of nine commercial and semi-commercial **whey protein** concentrates, isolates and fractions.

AU Holt C.; McPhail D.; Nevison I.; Nylander T.; Otte J.; Ipsen R.H.; Bauer R.; Ogendal L.; Olieman K.; de Kruif K.G.; Leonil J.; Molle D.; Henry G.; Maubois J.L.; Perez M.D.; Puyol P.; Calvo M.; Bury S.M.; Kontopidis G.;

McNae I.; Sawyer L.; Ragona L.; Zetta L.; Molinari H.; Klarenbeek B.; Jonkman M.J.; Moulin J.; Chatterton D.

SO International Journal of Food Science and Technology, 1999, (October-December), 34 (5-6), 587-601 (30 ref.)
ISSN: 0950-5423

DT Journal

LA English

SL English

AB **Whey-protein** products need to have consistent properties. Previous research has indicated that samples can be differentiated according to their beta-**lactoglobulin** content. **Whey-protein** samples were analysed using a number of physicochemical techniques to aid understanding of the links, if any, between properties and composition and molecular structure. Aggregation, gelation and denaturation behaviour of samples could be related to the sample's **protein** composition and the degree of lactosylation of beta-**lactoglobulin**. Interfacial behaviour could not be easily related to any compositional factor or **protein** damage measurement.

SH PROTEINS

CT AGGREGATION; COMPOSITION; DAIRY PRODUCTS; DEGRADATION; DENATURATION; GELATION; INTERFACES; **MILK PROTEIN**; **PROTEIN** ; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN ISOLATE**

DED 11 Jan 2000

L8 ANSWER 143 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 508130 FROSTI

TI Interfacial ageing effect on the rheology of a heat-set **protein** emulsion gel.

AU Chen J.; Dickinson E.

SO Food Hydrocolloids, 1999, (September), 13 (5), 363-369 (33 ref.)
ISSN: 0268-005X

DT Journal

LA English

SL English

AB The cross-linking and aggregation of **protein** molecules into gels contribute to the development of structure and desirable mechanical properties. The viscoelasticity of heat-set **whey-protein** emulsion gels was examined. The effects of the emulsion age on the emulsion rheology were studied. Emulsions were made using pure beta-**lactoglobulin**. After emulsification, **whey-protein isolate** was dissolved into the emulsion aqueous phase before heat treatment. The effects of ageing on the direct interlayer bonding between emulsion droplets were studied using a highly concentrated emulsion. Aged emulsion droplets were less active in enhancing the viscoelasticity of the gel. The **protein** monolayer was thought to become flattened at the droplet surface as a result of unfolding and polymerization. The gel made from the aged emulsion behaved like a particle gel rather than a biopolymer gel. The effects of ageing were less significant for the highly concentrated emulsion.

SH PROTEINS

CT AGEING; BETA **LACTOGLOBULIN**; EMULSIONS; GELS; HEATING; **LACTOGLOBULIN**; MILK PROTEINS; PROTEINS; RHEOLOGICAL PROPERTIES; **WHEY PROTEIN ISOLATE**

DED 23 Nov 1999

L8 ANSWER 144 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 505592 FROSTI

TI Fractionation of milk proteins.

AU Maubois J.-L.

SO Proceedings of the 25th International Dairy Congress, Aarhus, September 1998. Volume 2: dairy science and technology., Published by: Danish

National Committee of the IDF, Aarhus, 1999, 74-86 (35 ref.)
Danish National Committee of the IDF
ISBN: 87-89795-82-2

DT Conference Article

LA English

AB There is increasing interest in the use of separated milk proteins in functional foods and nutraceutical products. The dairy industry has developed advanced procedures for the separation of milk proteins. In this chapter, the basic principles of the separation of milk proteins are explained, and recent advances in the separation and purification of proteins from fluid milk are reviewed. Methods of controlling microbial growth during **protein** separations are mentioned and include chilling, membrane microfiltration, and more recently, two microfilters in cascade, dynamic membrane filtration, and improved ceramic membranes. The chapter then reviews developments in the preparation of micellar casein and **whey protein** isolates (an integrated **protein** extraction process), beta-**lactoglobulin**, and kappa-glycomacropeptide (and antithrombic peptides). Figure are presented that illustrate the steps involved in milk-**protein** separation, the preparation of beta-**lactoglobulin**, and the manufacture of glycomacropeptide.

SH DAIRY PRODUCTS

CT BETA **LACTOGLOBULIN**; CASEIN; DAIRY PRODUCTS; EXTRACTION; KAPPA GLYCOMACROPEPTIDE; **LACTOGLOBULIN**; MEMBRANES; MILK; MILK PROTEINS; PRODUCTION; PROTEINS; PURIFICATION; SEPARATION; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**

DED 21 Oct 1999

L8 ANSWER 145 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 502568 FROSTI

TI Functional properties of proteins and lipids: developed from a symposium, Cancun, November 1997.

AU Whitaker J.R.; Shahidi F.; Munguia A.L.; Yada R.Y.; Fuller G.; American Chemical Society.

SO Published by: ACS, Washington D.C., 1998, 292pp
ACS Symposium Series, No. 708
ISBN: 0-8412-3584-8

DT Conference

LA English

AB The following papers are presented: 'Molecular bases of surface activity of proteins'; 'Computer-aided optimization of site-directed mutagenesis of Bacillus stearothermophilus neutral protease for improving thermostability'; 'Computer analysis of **protein** properties'; 'Evaluation of viscous food properties using a helical ribbon impeller'; 'Production of high-**protein** flours as milk substitutes'; 'Functional properties of soy proteins'; 'Effect of acylation on flax **protein** functionality'; 'Structure-function relationships in milk-clotting enzymes, pepsin - a model'; 'Functional properties of **whey** proteins in forming networks'; '**Whey protein** interactions - effects on edible film properties'; 'Thermal denaturation and gelation characteristics of beta-**lactoglobulin** genetic variants'; 'Limited proteolysis of alpha-**lactalbumin** and **whey protein isolate** - effect on their functional properties'; 'Emulsifying properties of cholesterol-reduced egg yolk low-density lipoprotein'; 'Functional properties of goat meat proteins'; 'Physicochemical aspects of triacylglycerides and their association to functional properties of vegetable oils'; 'Low-calorie fats and sugar esters'; and 'Intestinal absorption and physiologically functional food substances'.

CT ANALYSIS; ANIMAL PROTEINS; APPLICATIONS; CHEMICAL PROPERTIES; EMULSIFYING PROPERTIES; EVALUATION; FACTORS AFFECTING; FATS; FOAMING PROPERTIES; FUNCTIONAL PROPERTIES; LIPOPROTEINS; PLANT PROTEINS; PROTEINS; RHEOLOGICAL PROPERTIES; STRUCTURE

DED 9 Sep 1999

L8 ANSWER 146 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 502562 FROSTI
TI Limited proteolysis of alpha-**lactalbumin** and **whey protein isolate**: effect on their functional properties.
AU Vojdani F.; Whitaker J.R.
SO Functional properties of proteins and lipids: developed from a symposium, Cancun, November 1997., Published by: ACS, Washington D.C., 1998, 184-204 (11 ref.)
Whitaker J.R.
ISBN: 0-8412-3584-8
DT Conference Article
LA English
AB The effects of limited proteolysis on the functional (emulsifying and foaming) properties of purified alpha-lactalabumin and **whey** proteins were investigated using endoproteinases (Arg-C, Lys-C, Glu-C and trysin) at pH 2.0 to 10. It is reported that proteins such as beta-**lactoglobulin**, alpha-**lactalbumin**, serum albumin and lactoferrin are relatively soluble except in the pH region 4 to 6. Use of these proteins is, therefore, limited in foods such as fruit juices and vegetable products that have pH values in this region. Results of this study showed some improvement in foam capacity and stability around pH 5, suggesting that specific endoproteinases can be used to improve functional properties and stability in acidic food products.
SH PROTEINS
CT ALPHA **LACTALBUMIN**; BETA **LACTOGLOBULIN**; CHEMICAL PROPERTIES; EMULSIFYING PROPERTIES; ENDOPROTEINASES; ENZYMES; FACTORS AFFECTING; FOAMING PROPERTIES; FUNCTIONAL PROPERTIES; IMPROVEMENT; **LACTALBUMIN**; **LACTOGLOBULIN**; MILK PROTEINS; PH; PROTEINS; SOLUBILITY; **WHEY** PROTEINS
DED 9 Sep 1999

L8 ANSWER 147 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 499100 FROSTI
TI Milking the nutrition market.
AU Broihier K.
SO Food Processing, Chicago, 1999, (March), 60 (3), 41-44 (0 ref.)
DT Journal
LA English
AB This article describes new applications for milk and **whey-protein** isolates. Milk **protein** isolates are produced through filtration, and **whey-protein** isolates with microfiltration. Milk proteins are a good source of nutrition, calcium, **protein** and casein, and have low levels of lactose. **Whey-protein** isolates contain proteins, amino acids, alpha-**lactalbumin**, and beta-**lactoglobulin**. Supercritical fluid extraction means that the isolates can be incorporated in extruded foods. **Whey-protein** gels can provide an alternative to egg white, soya **protein**, or gelatin. Other applications for milk and **whey-protein** isolates include edible films, sports and energy foods, and adult nutrition.
SH DAIRY PRODUCTS
CT AMINO ACIDS; APPLICATIONS; BASIC GUIDE; COMPOSITION; CONTENT; MILK **PROTEIN**; MILK **PROTEIN ISOLATE**; PROCESSING; **PROTEIN**; PROTEINS; **WHEY PROTEIN**; **WHEY PROTEIN ISOLATE**
DED 27 Jul 1999

L8 ANSWER 148 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 498036 FROSTI
TI Sepralac process for the separation of **whey** proteins.
AU Ahmed S.; Mozaffar Z.; Saxena V.; Miranda Q.R.

SO Whey: proceedings of the Second International Whey Conference, Chicago, October 1997., Published by: IDF, Brussels, 1998, 100 (0 ref.) International Dairy Federation
ISBN: 92-9098-030-4
DT Conference Article
LA English
AB This brief chapter summarises the features and advantages of a newly developed chromatographic process, which uses radial-flow chromatography columns to purify **whey protein isolate** and individual **whey** proteins (alpha-**lactoglobulin**, beta-**lactoglobulin**, bovine serum albumin, lactoferrin, lactoperoxidase, and peptides) from cheese **whey**. The chapter reports that the new system is 'an efficient, economical and environmentally friendly process for the commercialization of **whey** proteins'.
SH PROTEINS
CT CHEESE **WHEY**; CHROMATOGRAPHY; DAIRY PRODUCTS; EQUIPMENT; EXTRACTION; MILK PROTEINS; PROTEINS; PURIFICATION; SEPARATION; **WHEY**; **WHEY** PROTEINS
DED 13 Jul 1999

L8 ANSWER 149 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 497591 FROSTI
TI The importance of **whey protein** fractions for WPC and WPI functionality.
AU Huffnam L.M.
SO Whey: proceedings of the Second International Whey Conference, Chicago, October 1997., Published by: IDF, Brussels, 1998, 197-205 (19 ref.) International Dairy Federation
ISBN: 92-9098-030-4
DT Conference Article
LA English
AB The concentration of **whey-protein** fractions has been reported to influence the functional properties of **whey-protein concentrate** (WPC) and **whey-protein isolate** (WPI). **Whey protein** fractions include beta-**lactoglobulin**, alpha-**lactoglobulin**, bovine serum albumin, glycomacropeptide, immunoglobulins, lactoferrin, and lactoperoxidase. The functional properties of WPC and WPI are outlined. The factors that influence the concentration of **whey protein** fractions in WPC and WPI are discussed and include cow genetics, feeding, seasonality, casein or cheese **whey** production, and processing. Methods that are used to determine the **protein**-fraction content and functionality are described and evaluated. The influence of minerals, lipids and ions on the functionality of WPC and WPI is mentioned. Tables are presented that show the concentration of **protein** fraction in WPI and WPC, and cheese WPC.
SH DAIRY PRODUCTS
CT COMPOSITION; DAIRY PRODUCTS; FACTORS AFFECTING; FUNCTIONAL PROPERTIES; **MILK PROTEIN**; PROCESSING; **PROTEIN**; QUANTITY; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**; **WHEY PROTEIN** FRACTIONS; **WHEY PROTEIN ISOLATE**
DED 9 Jul 1999

L8 ANSWER 150 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 489548 FROSTI
TI Structure of particulate **whey protein** gels: effect of sodium chloride concentration, pH, heating temperature, and **protein** composition.
AU Verheul M.; Roefs S.P.F.M.
SO Journal of Agricultural and Food Chemistry, 1998, 46 (12), 4909-4916 (46

ref.)
ISSN: 0021-8561
DT Journal
LA English
SL English
AB The gel structure of aggregated **whey** proteins strongly depends on the physical conditions. The influence of sodium chloride concentration, pH, heating temperature and **protein** composition on the structure of **whey-protein** gels was studied. The kinetics of aggregation were combined with the development of the gel structure and measurements of rheology, gel permeability and confocal scanning laser microscopy. **Whey-protein isolate** and beta-**lactoglobulin** gels were studied. The results showed that the mechanism for the heat-induced gelation of **whey** proteins developed for a limited set of conditions is also valid for a much broader, practically relevant range of conditions. Particulate, heat-induced **whey-protein** gels are formed via a denaturation/aggregation/gelation mechanism.
SH DAIRY PRODUCTS
CT AGGREGATION; BETA **LACTOGLOBULIN**; CHEMICAL PROPERTIES; DEGRADATION; DENATURATION; GELATION; GELS; HEATING; **LACTOGLOBULIN**; MECHANISMS; MILK PROTEINS; PARTICULATE GELS; PERMEABILITY; PH; **PROTEIN** GELS; PROTEINS; RHEOLOGICAL PROPERTIES; SALTS; SODIUM CHLORIDE; TEMPERATURE; **WHEY** PROTEINS
DED 23 Mar 1999

L8 ANSWER 151 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 477741 FROSTI
TI Winning wheys.
AU Burrington K.J.
SO Prepared Foods, 1998, (July), 167 (7), 83-89 (4pp) (0 ref.)
ISSN: 0747-2536
DT Journal
LA English
AB **Whey** is an important by-product of cheese manufacture. It contains lactose, minerals (e.g. calcium), vitamins and proteins. **Whey** and **whey** products are used to fortify many food products. **Whey** permeate is used to produce lactose, alcohol, single-cell sources of **protein**, glucose and cattle feed. **Whey-protein isolate** is used to make low-fat and fat-free products. **Whey-protein concentrate** (WPC) has a wide range of functional properties (e.g. good solubility, water-binding, gelation, foaming and emulsifying properties). These properties make WPC useful in beverages, processed meats, baked goods, yoghurt and low-fat foods. Applications for specific **whey** proteins (e.g. beta-**lactoglobulin**) include food stabilization. Specialized wheys (e.g. de-mineralized wheys) have been developed.
SH DAIRY PRODUCTS
CT APPLICATIONS; DAIRY PRODUCTS; **MILK PROTEIN**; **PROTEIN**; **WHEY**; **WHEY** PERMEATE; **WHEY** PRODUCTS; **WHEY PROTEIN**; **WHEY PROTEIN CONCENTRATE**
DED 21 Oct 1998

L8 ANSWER 152 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 472721 FROSTI
TI Aggregate formation during hydrolysis of beta-**lactoglobulin** with a Glu and Asp specific protease from Bacillus licheniformis.
AU Otte J.; Lomholt S.B.; Ipsen R.; Stapelfeldt H.; Bukrinksy J.T.; Qvist K.B.
SO Journal of Agricultural and Food Chemistry, 1997, December, 45 (12), 4889-4896 (18 ref.)

DT Journal
LA English
SL English
AB The hydrolysis of isolated beta-**lactoglobulin** by a protease from Bacillus licheniformis was followed and the formation of aggregates and gels was assessed. Changes in hydrolysis were studied by electrophoresis, fluorescence, dynamic light scattering and circular dichroism spectroscopy. The aggregates consisted of peptides with molecular weight 2000-6000 and pH 5-8, and are thought to be important in protease-induced gelation of **whey-protein isolate** solutions. Non-covalent interactions appear to be major interacting forces.
CT AGGREGATION; BACILLUS LICHENIFORMIS; FORMATION; GELS; HYDROLYSIS; OLD MATERIAL; PROTEASES
DED 5 Aug 1998

L8 ANSWER 153 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 472500 FROSTI
TI Mechanical properties, water vapor permeability, and moisture contents of beta-**lactoglobulin** and **whey protein** films using multivariate analysis.
AU Anker M.; Stading M.; Hermansson A.-M.
SO Journal of Agricultural and Food Chemistry, 1998, (May), 46 (5), 1820-1829 (37 ref.)
DT Journal
LA English
SL English
AB **Whey** proteins are of interest for the production of edible films. The mechanical properties, water vapour permeability and moisture content of **whey-protein** films were studied by multivariate analysis. The films were cast from heated aqueous solutions with sorbitol as plasticizer, and dried at 23 C and 50% relative humidity for 16 hours. The influence of concentration of beta-**lactoglobulin** and **whey-protein isolate**, sorbitol concentration and pH was also determined. The mechanical and barrier properties were significantly affected by the ratio of the beta-**lactoglobulin** and **whey-protein isolate** concentrations and the sorbitol concentration.
SH ADDITIVES
CT BETA **LACTOGLOBULIN**; FACTORS AFFECTING; MECHANICAL PROPERTIES; PERMEABILITY; **PROTEIN** FILMS; SORBITOL; **WHEY PROTEIN** CONCENTRATE
DED 24 Jul 1998

L8 ANSWER 154 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 461588 FROSTI
TI Effects of lecithin addition in oil or water phase on the stability of emulsions made with **whey** proteins.
AU Yamamoto Y.; Araki M.
SO Bioscience, Biotechnology, and Biochemistry, 1997, (November), 61 (11), 1791-1795 (37 ref.)
DT Journal
LA English
SL English
AB Gravitational creaming and phase separation measurements were used to monitor the stability of oil-in-water emulsions made with **whey protein isolate** (WPI) and beta-**lactoglobulin**. The effects of lecithin addition on emulsion stability at neutral and acid pH were studied. The results and the mechanism of the effects are examined in detail. They indicate that the purity of the lecithin and the means of its addition are important determinants of emulsion stability. They also indicate that, in acid pH, densely packed films may

be formed on a planar oil-water interface, but not on adsorbed layers around emulsion oil droplets.
SH ADDITIVES
CT EMULSION; LECITHIN; PH; STABILITY; **WHEY PROTEIN** ISOLATES
DED 19 Feb 1998

L8 ANSWER 155 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 458804 FROSTI
TI Out of the dairy case. (Dairy ingredients.)
AU Gorski D.
SO Dairy Foods, 1997, (November), 98 (12), 37-38 (0 ref.)
DT Journal
LA English
AB This basic guide to dairy ingredients discusses functional and physical characteristics of **milk** components and by-products. These can enhance nutritional value and flavour, and project an 'all-natural' image. The article covers whole **milk** powder, non-fat dry **milk** (dried skimmed **milk**), **whey**, **whey -protein concentrate**, **whey-protein isolate**, lactoperoxidase, lactoferrin, **lactalbumin**, and **lactoglobulin**.
SH DAIRY PRODUCTS
CT APPLICATIONS; BASIC GUIDE; DAIRY BY PRODUCTS; DAIRY INGREDIENTS; FUNCTIONAL PROPERTIES; **MILK** BY PRODUCTS
DED 9 Jan 1998

L8 ANSWER 156 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 458113 FROSTI
TI Gel characteristics of beta-**lactoglobulin**, **whey protein** concentrate and **whey protein isolate**.
AU Twomey M.; Keogh M.K.; Mehra R.; O'Kennedy B.T.
SO Journal of Texture Studies, 1997, (September), 28 (4), 387-403 (15 ref.)
DT Journal
LA English
SL English
AB The gelation of proteins is dependent on a number of factors including **protein** type, pH, temperature and the presence of ions. This study determined the effects of **protein** concentration, sodium chloride concentration, calcium chloride concentration and pH on the gelation characteristics of beta-**lactoglobulin**, **whey protein isolate** and **whey protein** concentrate. An increase in calcium concentration resulted in a decrease in gel point and an increase in turbidity, whilst an increase in pH caused a decrease in denaturation temperature. The deformation and consistency of the gels formed were most strongly affected by **protein** concentration.
SH PROTEINS
CT CALCIUM IONS; FACTORS AFFECTING; GELATION; PH; PROTEINS; QUANTITY; RHEOLOGICAL PROPERTIES; SODIUM IONS
DED 19 Dec 1997

L8 ANSWER 157 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 438978 FROSTI
TI Production of **whey-protein**-enriched products.
AU Mulvihill D.M.; Grufferty M.B.
SO Food proteins and lipids: proceedings of a symposium, Chicago, August 1995., Published by: Plenum Press, New York, 1997, 77-93 (many ref.)
Damodaran S.
ISBN: 0-306-45586-2
DT Conference Article
LA English

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     (FILE 'HOME' ENTERED AT 08:06:40 ON 16 SEP 2004)

     FILE 'FSTA, FROSTI' ENTERED AT 08:06:49 ON 16 SEP 2004
L1          4825 S LACTALBUMIN OR LACTOGLOBULIN OR SIALYLLACTOSE
L2          3772 S (MILK AND PROTEIN AND CONCENTRATE) OR (WHEY AND PROTEIN AND I
L3           374 S L1 AND L2
L4             0 S (MILK ADJ1 PROTEIN ADJ1 CONCENTRATE) OR (WHEY ADJ1 PROTEIN AD
L5           265 S MILK PROTEIN CONCENTRATE
L6           997 S WHEY PROTEIN ISOLATE
L7            13 S L3 AND L5
L8           191 S L3 AND L6
L9         52950 S MILK/TI
L10            9 S L8 AND L9
L11        15300 S ENRICH OR ENRICHED OR ENRICHMENT

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L12            6 L7 AND L11

=> d 1-6 ti

L12  ANSWER 1 OF 6  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Membrane filtered milk proteins varying in composition and
     functional attributes.

L12  ANSWER 2 OF 6  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Trends in the production & utilisation of dairy protein
     products: production.

L12  ANSWER 3 OF 6  FSTA  COPYRIGHT 2004 IFIS on STN
TI   [Uses of milk protein in the food industry.]

L12   ANSWER 4 OF 6  FROSTI  COPYRIGHT 2004 LFRA on STN
TI    Dairy products.

L12   ANSWER 5 OF 6  FROSTI  COPYRIGHT 2004 LFRA on STN
TI    Production, functional properties and utilization of milk
      protein products.

L12   ANSWER 6 OF 6  FROSTI  COPYRIGHT 2004 LFRA on STN
TI    Trends in the production and utilisation of dairy protein
      products: production.


=> s l11 and l8
L13            8 L11 AND L8

=> d l13 1-8 ti

L13  ANSWER 1 OF 8  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Fractionation of whey proteins by bipolar membrane
     electroacidification.

L13  ANSWER 2 OF 8  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Kinetics of thermal denaturation of β- lactoglobulin
     (β-Lg) as determined by fast  protein liquid chromatography
     (FPLC).

L13  ANSWER 3 OF 8  FSTA  COPYRIGHT 2004 IFIS on STN
TI   Trends in the production & utilisation of dairy protein
     products: production.
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L13 ANSWER 4 OF 8 FROSTI COPYRIGHT 2004 LFRA on STN
TI Process for recovering proteins from **whey protein** containing feedstocks.

L13 ANSWER 5 OF 8 FROSTI COPYRIGHT 2004 LFRA on STN
TI Separation of bovine immunoglobulin G and glycomacropeptide from dairy **whey**.

L13 ANSWER 6 OF 8 FROSTI COPYRIGHT 2004 LFRA on STN
TI Functional properties of the **whey protein** fractions produced in pilot scale processes. Foaming, water-holding capacity and gelation.

L13 ANSWER 7 OF 8 FROSTI COPYRIGHT 2004 LFRA on STN
TI Rapid Visco Analysis of dairy ingredients.

L13 ANSWER 8 OF 8 FROSTI COPYRIGHT 2004 LFRA on STN
TI Production of **whey-protein-enriched** products.

=>

AB **Whey** was originally considered to be an undesirable by-product of cheese manufacture, but today the nutritional value of **whey** has been realised and consequently **whey** is now considered to be a co-product of cheese manufacture. The production of **whey** -based products are briefly summarised. Consideration is given to the composition and pre-processing (clarification, separation and pasteurization) of **whey**; the crystallization and drying of whole **whey** powders; the demineralization of **whey** products; lactose and delactose **whey** products; the ultrafiltration/diafiltration and ion-exchange adsorption of **whey protein** concentrate and **whey protein isolate**; **lactalbumin**; electrochemical coagulation of **whey protein**; and the fractionation of **whey** proteins (e.g. beta-**lactoglobulin**, alpha-**lactalbumin**, lactoperoxidase, lactotransferrin and glycomacropeptide).
SH DAIRY PRODUCTS
CT COMPOSITION; FRACTIONATION; **LACTALBUMIN**; **LACTOGLOBULIN** ; PROCESSING; **WHEY**; **WHEY** POWDER; **WHEY** PRODUCTS; **WHEY PROTEIN** CONCENTRATE; **WHEY** PROTEINS
DED 1 Jul 1997

L8 ANSWER 158 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 436956 FROSTI
TI Stabilization of **protein**-based emulsions by means of interacting polysaccharides.
AU Dalgleish D.G.; Hollocou A.-L.
SO Food colloids - proteins, lipids and polysaccharides: proceedings of a conference, Ystad, April 1996., Published by: RSC, Cambridge, 1997, 236-244 (9 ref.)
Dickinson E.; Bergenstahl B.
ISBN: 0-85404-776-X
DT Conference Article
LA English
AB Although proteins and polysaccharides do not generally interact in emulsions (proteins adsorb to the surface of lipid droplets, which provides stability, whereas polysaccharides remain in solution and increase viscosity), interactions between proteins and polysaccharides can sometimes occur. Examples include casein and kappa-carrageenan, and casein and high-methoxyl pectin at low pH. In this study, interactions between polysaccharides (pectin and carrageenan) and emulsions containing milk proteins (**whey protein isolate**, alpha-**lactalbumin**, beta-**lactoglobulin** and casein) were investigated. Emulsion stabilization was obtained in emulsions containing pectin or carrageenan at pH values where precipitation of the emulsion not containing either polysaccharide generally occurred. Mechanisms involved in this stabilization are postulated.
SH PROTEINS
CT CARRAGEENAN; CASEIN; EMULSIONS; INTERACTIONS; MILK PROTEINS; PECTIN; POLYSACCHARIDES; PROTEINS; STABILITY
DED 5 Jun 1997

L8 ANSWER 159 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 432801 FROSTI
TI Characteristics of the products of limited proteolysis of beta-**lactoglobulin**.
AU Swaisgood H.E.; Huang X.L.; Catignani G.L.
SO Macromolecular interactions in food technology: proceedings of a symposium, Honolulu, December 1995., Published by: ACS, Washington D.C., 1996, 166-177 (33 ref.)
Parris N.
ISBN: 0-8412-3466-3
DT Conference Article

LA English
AB It has been reported that, at pH 7, **whey protein isolate** (WPI) forms fine-stranded transparent gels, and particulate gels can be formed by increasing sodium-chloride or calcium-chloride concentrations. Results of this study showed that limited proteolysis of beta-**lactoglobulin** modified the gelling characteristics of **whey protein isolate** (WPI) so that particulate gels were formed at pH 7 in low-salt solutions.
SH PROTEINS
CT APPLICATIONS; BETA; BETA **LACTOGLOBULIN**; CALCIUM CHLORIDE; DEGRADATION; FORMATION; GELATION; GELLING PROPERTIES; GELS; **LACTOGLOBULIN**; LOW; LOW PH; LOW **PROTEIN**; LOW QUANTITY; LOW SALT; LOW SODIUM CHLORIDE; PARTIAL; PARTICLE PROPERTIES; PARTICLES; PH; PROPERTIES; **PROTEIN** GELS; PROTEINS; SALTS; SODIUM CHLORIDE; SODIUM CHLORIDE GELS; TRANSPARENT; TRYPSIN; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 3 Apr 1997

L8 ANSWER 160 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 430830 FROSTI
TI The effects of calcium chloride on aggregation of **whey** proteins.
AU Sherwin C.P.; Foegeding E.A.
SO Milchwissenschaft, 1997, 52 (2), 93-96 (12 ref.)
DT Journal
LA English
SL English; German
AB **Whey** proteins have many functional applications in foods. During the processing of **whey** into high-**protein** ingredients, calcium causes aggregation of **whey** proteins. This effect might change the functional properties of **whey**. This study investigated the effects of temperature (40, 50, 60 and 70 C) and the calcium:**protein** ratio (1.67 to 33.3 mM/%) on the aggregation of **whey** proteins. Aggregation rates of calcium-containing **protein** (**whey protein isolate** and beta-**lactoglobulin**) solutions were determined by monitoring turbidity changes. The results showed that the calcium-induced aggregation of **whey protein isolate** and beta-**lactoglobulin** was dependent on temperature, calcium chloride to **protein** ratio and equilibration time. Maximum rates of aggregation occurred between 3.33 and 23.3 calcium (mM)/**protein** (%). Excess calcium chloride inhibited aggregation.
SH PROTEINS
CT AGGLOMERATION; BETA; BETA **LACTOGLOBULIN**; CALCIUM CHLORIDE; **LACTOGLOBULIN**; PROTEINS; RATE; TEMPERATURE; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 4 Apr 1997

L8 ANSWER 161 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 429880 FROSTI
TI Enzymatic cross-linking of **whey** proteins by a calcium-independent microbial transglutaminase from Streptomyces lydicus.
AU Faergemand M.; Otte J.; Qvist K.B.
SO Food Hydrocolloids, 1997, 11 (1), 19-25 (29 ref.)
DT Journal
LA English
SL English
AB Enzymic cross-linking of food proteins has been considered as a method for improving functional properties. Transglutaminase (TGase) is an enzyme capable of forming inter- or intramolecular cross-links in many proteins. A calcium-independent microbial TGase derived from Streptomyces lydicus was used to cross-link **whey** proteins in

whey-protein isolate (WPI) and beta-**lactoglobulin**. The results indicated that TGase derived from S. lydicus can polymerise **whey** proteins extensively in the absence of calcium ions, under reducing conditions or at high pH values. The polymerised **whey protein** in WPI or polymerised beta-**lactoglobulin** formed transparent gels after a few hours with TGase at 40 C. It is concluded that TGase from S. lydicus has potential as an enzymic method of producing covalently cross-linked **whey-protein** gels.

SH PROTEINS

CT BACTERIA; BACTERIAL ENZYMES; BACTERIAL **PROTEIN**; BACTERIAL PROTEINS; CROSS LINKING; DAIRY PRODUCTS; ENZYMES; LYDICUS; MILK **PROTEIN**; MILK PROTEINS; PROTEINS; STREPTOCOCCUS; TRANSGLUTAMINASE; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 13 Mar 1997

L8 ANSWER 162 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 428601 FROSTI

TI Thermal stabilization of beta-**lactoglobulin** by **whey protein** fractions.

AU Barbeau J.; Gauthier S.F.; Pouliot Y.

SO Journal of Agricultural and Food Chemistry, 1996, 44 (12), 3939-3945 (62 ref.)

DT Journal

LA English

SL English

AB The effects of **whey** peptide fractions at different pH values on the thermal stability of **lactoglobulin** were investigated by differential scanning calorimetry. Tryptic hydrolysate of **whey-protein isolate** was fractionated by anion-exchange chromatography and hydrophobic interaction chromatography. The thermal denaturation profiles of the **lactoglobulin** were obtained. The results suggested that the binding of peptides to beta-**lactoglobulin**, possibly via ionic or hydrophobic interactions, might stabilise beta-**lactoglobulin** against heat treatment.

SH PROTEINS

CT DEGRADATION; FRACTIONATION; **LACTOGLOBULIN**; PEPTIDES; PH; THERMAL STABILITY; **WHEY**

DED 13 Feb 1997

L8 ANSWER 163 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 427788 FROSTI

TI Oil-in-water emulsions stabilized by sodium caseinate or **whey protein isolate** as influenced by glycerol monostearate.

AU Euston S.E.; Singh H.; Munro P.A.; Dalgleish D.G.

SO Journal of Food Science, 1996, 61 (5), 916-920 (25 ref.)

DT Journal

LA English

SL English

AB The major functional role of glycerol monostearate in ice cream is emulsion destabilisation. The influence of glycerol monostearate on competitive adsorption in oil-in-water emulsions of 20 wt% soya oil/deionised water (pH 7), prepared with sodium caseinate or **whey protein isolate** (WPI) was investigated.
The competitive adsorption between glycerol monostearate and WPI was studied. The **protein** surface concentration and average droplet diameter were determined. The distribution of alpha-**lactalbumin** and beta-**lactoglobulin** between the aqueous bulk phase and the fat surface in WPI-stabilised emulsions was independent of the concentration of added **protein** or surfactant.

SH DAIRY PRODUCTS

CT ADSORPTION; ANTAGONISM; ECONOMIC COMPETITION; EMULSIONS; GLYCEROL

MONOSTEARATE; ICE CREAM; ISOLATES; OIL EMULSIONS; OILS; **PROTEIN** ISOLATES; PROTEINS; SODIUM CASEINATE; WATER; WATER EMULSIONS; WATER SORPTION; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 30 Jan 1997

L8 ANSWER 164 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 423199 FROSTI
TI Comparison of oxygen and water vapor permeabilitites of **whey protein isolate** and beta-**lactoglobulin** edible films.
AU Mate J.I.; Krochta J.M.
SO Journal of Agricultural and Food Chemistry, 1996, 44 (10), 3001-3004 (20 ref.)
DT Journal
LA English
SL English
AB Edible films and coatings can prevent quality deterioration and increase shelf-life of food products. The oxygen permeability and water-vapour permeability of **whey-protein-isolate** and beta-**lactoglobulin** edible films were investigated at three different levels of glycerol content (15, 30 and 40%). The effects of temperature (15, 23, 30 and 37 C) on the oxygen permeability of these films were also determined. The results were fitted to the Arrhenius model, and activation energies were determined.
SH ADDITIVES
CT EDIBLE; EDIBLE FILMS; EDIBLE PROTEINS; FILMS; GLYCEROL; ISOLATES; **LACTOGLOBULIN**; OXYGEN; OXYGEN PERMEABILITY; PERMEABILITY; **PROTEIN** FILMS; **PROTEIN** ISOLATES; PROTEINS; TEMPERATURE; VAPOUR; WATER; WATER PERMEABILITY; WATER VAPOUR; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 3 Dec 1996

L8 ANSWER 165 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 420780 FROSTI
TI Reaction kinetics of pressure-induced denaturation of **whey** proteins.
AU Hinrichs J.; Rademacher B.; Kessler H.G.
SO Milchwissenschaft, 1996, 51 (9), 504-509 (24 ref.)
DT Journal
LA English
SL English; German
AB Structural changes of products can result from the high-pressure denaturation of proteins. The kinetic data of pressure-induced denaturation of **whey** proteins were investigated. The activation volume was estimated. Aqueous solutions containing **whey-protein isolate** were treated at high pressure (200-800 Mpa) for 0-3840 seconds. The remaining contents of native beta-lactoglobin and alpha-**lactalbumin** were determined. The denaturation effect of pressure increase and release was calculated.
SH DAIRY PRODUCTS
CT ACTIVATION VOLUME; DEGRADATION; HIGH; HIGH PRESSURE; HIGH **PROTEIN** ; HIGH QUANTITY; ISOLATES; PRESSURE; **PROTEIN** ISOLATES; PROTEINS; RATE; THERMODYNAMIC; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 1 Nov 1996

L8 ANSWER 166 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 416902 FROSTI
TI Effects of **protein** concentration and degree of hydrolysis during heating on the aggregation of beta-**lactoglobulin**.
AU Sato K.; Imai H.; Nakamura M.; Nishiya T.; Kawanari M.; Nakajima I.
SO Milchwissenschaft, 1996, 51 (7), 380-382 (19 ref.)

DT Journal
LA English
SL English; German
AB Preferential aggregation of beta-**lactoglobulin** has been observed when a **whey-protein-isolate** (WPI) solution is partially hydrolysed with trypsin prior to heat treatment. Factors affecting the preferential aggregation of beta-**lactoglobulin** in heat-treated WPI hydrolysates were investigated. The turbidity and sulfhydryl content were determined. The effects of **protein** concentration and degree of hydrolysis were examined. The findings showed that the preferential aggregation of beta-**lactoglobulin** could be used to eliminate beta-**lactoglobulin** from WPI solution without the formation of bitterness.
SH DAIRY PRODUCTS
CT AGGLOMERATION; DAIRY PRODUCTS; FACTORS AFFECTING; ISOLATES; **LACTOGLOBULIN**; MILK **PROTEIN**; MILK PROTEINS; PREFERENCES; **PROTEIN** ISOLATES; PROTEINS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 9 Sep 1996

L8 ANSWER 167 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 415071 FROSTI
TI Preparation and some properties of heat-treated **whey protein** hydrolysates.
AU Sato K.; Nakamura M.; Nishiya T.; Kawanari M.; Nakajima I.
SO Milchwissenschaft, 1996, 51 (6), 324-327 (15 ref.)
DT Journal
LA English
SL English; German
AB Previous studies have shown that both heat treatment and proteolytic digestion can change the physical properties and the behaviour of **whey protein**. The behaviour of heat-treated **whey-protein** concentrate solution hydrolysed with trypsin at neutral pH and heated at 90C for 1 minute was investigated. Turbidity, gel filtration, molecular weight distribution, SDS-PAG patterns and elution profiles were determined. The findings indicated preferential aggregation of beta-**lactoglobulin** in the tryptic **whey-protein-isolate** hydrolysates during heat treatment.
SH PROTEINS
CT HEATING; HYDROLYSIS; ISOLATES; PHYSICAL; PHYSICAL PROPERTIES; PROPERTIES; **PROTEIN** ISOLATES; PROTEINS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 13 Aug 1996

L8 ANSWER 168 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 412126 FROSTI
TI Effects of ionic strength on the solubility of **whey protein** products. A colloid chemical approach.
AU de Wit J.N.; van Kessel T.
SO Food Hydrocolloids, 1996, 10 (2), 143-149 (28 ref.)
DT Journal
LA English
SL English
AB Determination of the extent of **whey protein** denaturation, derived from the solubility of **whey** proteins at pH 4.6, is a valuable predictive tool for functionality. Recent information on the 3-D structure of beta-**lactoglobulin**-A was combined with a quantitative description of electrostatic interactions of beta-**lactoglobulin**-A as a dipolar ion in low ionic strength media. Comparison of these results with experimentally determined solubility data at pH 4.6 indicated differences in the pH of minimum

solubility between **whey protein** concentrates and isolates. A **whey protein isolate** obtained by ionic exchange processing showed minimum solubility near the isoelectric point of beta-**lactoglobulin**-A. **Whey protein** concentrates with more than 80% **protein** on total solids showed minimal solubility in the pH range 4.6-5.0, which coincided with insolubility induced by **whey protein** denaturation.

SH BIOCHEMISTRY

CT CONCENTRATES; CONCENTRATION; DAIRY PRODUCT CONCENTRATES; DAIRY PRODUCTS; DEGRADATION; FUNCTIONAL; FUNCTIONAL PROPERTIES; IONS; ISOLATES; **MILK PROTEIN**; **MILK** PROTEINS; PH; PROPERTIES; **PROTEIN** CONCENTRATES; **PROTEIN** ISOLATES; PROTEINS; SOLUBILITY; STRUCTURE; **WHEY**; **WHEY CONCENTRATE** ; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 5 Jul 1996

L8 ANSWER 169 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 398175 FROSTI

TI Effect of preheating at high temperature under vacuum on physical properties of heat-induced **whey protein isolate** gels.

AU Fujino H.; Muguruma M.; Ogata T.; Ito T.; Ohashi T.

SO Nippon Shokuhin Kagaku Kogaku Kaishi, 1995, 42 (10), 762-768 (13 ref.)

DT Journal

LA Japanese

SL English

AB The physical properties of heat-induced **whey protein isolate** (WPI) gels were studied after WPI had been pre-heated to high temperatures under vacuum. Weak gels were formed at low temperatures (70 C) and strong gels were formed at high temperatures (90-100 C). An examination of the flow behaviour of pre-heated and untreated WPI indicated that a precursor of gelation, and a reduction in activation energy required for gelation, had occurred in the pre-heated WPI. HPLC analyses of pre-heated WPI showed changes in shape and surface charge of **protein** molecules, especially beta-**lactoglobulin**.

SH PROTEINS

CT GELS; HEATING; PHYSICAL; PHYSICAL PROPERTIES; PROPERTIES; **PROTEIN** GELS; PROTEINS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 15 Jan 1996

L8 ANSWER 170 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 360518 FROSTI

TI Beta-**lactoglobulin** separation from **whey protein isolate** on a large scale.

AU Mate J.I.; Krochta J.M.

SO Journal of Food Science, 1994, 59 (5), 1111-1114 (21 ref.)

DT Journal

LA English

SL English

AB A procedure for obtaining kilogram quantities of edible beta-**lactoglobulin** from commercial **whey protein isolate** is described. Beta-**lactoglobulin** was separated from other **whey** proteins in a solution of 15% **whey protein isolate** in distilled water, adjusted to pH 2 and 7% sodium chloride. A diafiltration process was then applied to separate the beta-**lactoglobulin** from the salt, and freeze-drying was used to obtain the final product. Small adjustments of pH were made during the operation. Electrophoresis was used to check the **protein** composition of the initial **whey protein isolate** and the beta-**lactoglobulin** product. About 65%

of the beta-**lactoglobulin** present in the initial solution was recovered as purified beta-**lactoglobulin**, while the purity of the product was greater than 95%.
SH PROTEINS
CT BETA **LACTOGLOBULIN**; DAIRY PRODUCTS; FILTRATION; ISOLATES; **LACTOGLOBULIN**; LARGE SCALE; MILK **PROTEIN**; MILK PROTEINS; **PROTEIN** ISOLATES; PROTEINS; SEPARATION; ULTRA; ULTRAFILTRATION; WATER; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 16 Dec 1994

L8 ANSWER 171 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 359426 FROSTI
TI Effect of pH on the stability and surface composition of emulsions made with **whey protein** isolates.
AU Hunt J.A.; Dalgleish D.G.
SO Journal of Agricultural and Food Chemistry, 1994, 42 (10), 2131-2135 (17 ref.)
DT Journal
LA English
SL English
AB The effect of pH on the stability and composition of emulsions made with different concentrations of **whey protein** **isolate** (WPI) was investigated. Emulsions made with various concentrations of WPI were most stable at pH 7 and least stable at pH 5.5. The buffer affected stability of emulsions made at pH 6. Emulsions made with citrate buffer at pH 6 were unstable and those with imidazole buffer stable. At pH 7, beta-**lactoglobulin** and alpha-lactoalbumin adsorbed in proportion to their concentration. At lower pH values, alpha-lactoalbumin adsorbed preferentially. The behaviour of the **whey** proteins was dependent on variations of tertiary and quaternary **protein** structure with pH.
SH PHYSICAL AND SENSORY
CT EMULSIONS; PH; PROTEINS; STABILITY; **WHEY**; **WHEY** **PROTEIN**; **WHEY** PROTEINS
DED 9 Dec 1994

L8 ANSWER 172 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 359425 FROSTI
TI Oscillatory rheological comparison of the gelling characteristics of egg white, **whey protein** concentrates, **whey** **protein isolate**, and beta-**lactoglobulin**.
AU Tang Q.; McCarthy O.J.; Munro P.A.
SO Journal of Agricultural and Food Chemistry, 1994, 42 (10), 2126-2130 (19 ref.)
DT Journal
LA English
SL English
AB The gelation properties of egg white, 2 commercially available **whey protein** concentrates, a commercially available **whey protein isolate**, and beta-**lactoglobulin** were compared using oscillatory rheological measurements and temperature sweep experiments. At a given **protein** concentration, egg white proteins had a higher initial gelation rate, a higher gel stiffness (G'), a lower gelation temperature, and a higher value of the ratio G'(80 C)/G'(20 C) than the **whey** proteins. Egg white proteins had a lower minimum **protein** concentration for gelation. **Whey** proteins could be made roughly equivalent to egg white proteins in terms of initial gelation rate and gel stiffness by increasing their salt content.
SH PHYSICAL AND SENSORY
CT EGG **PROTEIN**; EGG PROTEINS; EGG WHITE; EGG WHITE **PROTEIN** ; EGG WHITE PROTEINS; GELATION; PROTEINS; RHEOLOGICAL PROPERTIES;

WHEY; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 9 Dec 1994

L8 ANSWER 173 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 354240 FROSTI
TI Heat-induced gel formation of beta-**lactoglobulin** : A study on secondary and tertiary structure as followed by circular dichroism spectroscopy.
AU Matsuura J.E.; Manning M.C.
SO Journal of Agricultural and Food Chemistry, 1994, 42 (8), 1650-1656 (34 ref.)
DT Journal
LA English
SL English
AB Beta-**lactoglobulin** is the major component of **whey protein isolate** (WPI), and it has been demonstrated that the behaviour of WPI gels is very similar to that of beta-**lactoglobulin** gels. Purified beta-**lactoglobulin** was therefore used to study the gelation properties of WPI. Very short path length quartz cells were used to observe gel formation by circular dichroism spectroscopy. The effects of **protein** concentration, salt concentration and pH on structure were observed.
SH BIOCHEMISTRY
CT BETA **LACTOGLOBULIN**; CIRCULAR DICHROISM; CONCENTRATION; EXAMINATION; FORMATION; GELATION; GELS; ISOLATES; PH; **PROTEIN** GELS; **PROTEIN** ISOLATES; PROTEINS; SALTS; SPECTROSCOPY; STRUCTURE; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 20 Oct 1994

L8 ANSWER 174 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 342490 FROSTI
TI Effect of pH during heat processing of partially hydrolyzed **whey protein**.
AU Britten M.; Giroux H.J.; Gaudin V.
SO Journal of Dairy Science, 1994, 77 (3), 676-684 (35 ref.)
DT Journal
LA English
SL English
AB **Whey** proteins have excellent nutritional properties and can be modified by various treatments to improve their functional properties. The effects of the degree of hydrolysis and pH during the heat processing of partially hydrolysed **whey** proteins were investigated. The **whey protein isolate** was modified using a broad-spectrum protease combined with heat treatment. Aggregate formation and size distribution, native proteins, sulfhydryl groups and solubility were determined. Hydrolysis gave a mixture of beta-**lactoglobulin** peptides and native **whey** proteins. The amount and size of aggregate formed on heating depended on the degree of hydrolysis and the pH. Results are discussed in terms of the **protein**-peptide interactions.
SH PROTEINS
CT AGGREGATE; FORMATION; HEATING; HYDROLYSIS; INTERACTIONS; ISOLATES; PEPTIDES; PH; **PROTEIN** ISOLATES; PROTEINS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 20 May 1994

L8 ANSWER 175 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 341511 FROSTI
TI **Whey protein** concentrates and isolates: processing and functional properties.
AU Morr C.V.; Ha E.Y.W.
SO CRC Critical Reviews in Food Science and Nutrition, 1994, 33 (6), 431-476

(248 ref.)
DT Report
LA English
SL English
AB The principal **whey** proteins are beta-**lactoglobulin**, alpha-**lactalbumin**, bovine serum albumin, and the immunoglobulins. This review concentrates on publications regarding the physicochemical and functional properties of **whey protein concentrate** (WPC) (which contains 50-75% **protein**) and **whey protein isolate** (which contains at least 90% **protein**). Procedures for isolation, purification, and characterisation of the individual **whey** proteins in buffer solutions, and **whey** fractionation technology for manufacturing WPC with improved chemical and functional properties in food systems are covered in detail. The fundamental properties of **whey** proteins and the factors that affect **protein** functionality (composition, **protein** structure, and processing) are all discussed. There are numerous tables and figures, including the composition of **milk** serum, cheese (Cheddar and cottage) **whey**, WPC, bovine **milk** fat, and functional properties of WPC.
SH DAIRY PRODUCTS
CT CHARACTERIZATION; CHEESE; CHEESE **WHEY**; CONCENTRATES; ISOLATION; **MILK**; **MILK CONCENTRATE**; **MILK PROTEIN**; **MILK** PROTEINS; **PROTEIN** CONCENTRATES; PROTEINS; PURIFICATION; **WHEY**; **WHEY CONCENTRATE**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 17 May 1994

L8 ANSWER 176 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 339842 FROSTI
TI The effect of cations on rheological properties of **whey protein** gels.
AU Foegeding E.A.
SO Food proteins: structure and functionality., Published by: VCH Publishers, Weinheim, 1993, 341-343 (3 ref.)
Schwenke K.D.; Mothes R.
ISBN: 3-527-30037-6
DT Conference Article
LA English
AB The effects of divalent and monovalent cations on the strength of **whey protein isolate** (WPI) and beta-**lactoglobulin** gels were studied. The effects of sodium chloride and calcium chloride on the fracture properties of gels are reported.
SH PROTEINS
CT BETA; BETA **LACTOGLOBULIN**; CALCIUM CHLORIDE; FRACTURING; GELS; **LACTOGLOBULIN**; PH; **PROTEIN** GELS; PROTEINS; SHEAR STRAIN; SHEAR STRESS; SODIUM CHLORIDE; SODIUM CHLORIDE GELS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 21 Apr 1994

L8 ANSWER 177 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 336861 FROSTI
TI Heat gelation of **whey** proteins.
AU Gault P.; Korolczuk J.
SO Protein and fat globule modifications by heat treatment, homogenization and other technological means for high quality dairy products., Published by: IDF, Brussels, 1993, 293-296 (15 ref.)
International Dairy Federation.
ISBN: 92-9098-011-8
DT Conference Article
LA English

AB It is reported that electrodialysis decreased the heat gelation by **whey protein isolate** (WPI) and beta-lactoglobulins. Addition of calcium or sodium ions to elctrodialysed proteins increased the strength of gels.
SH PROTEINS
CT BETA; BETA **LACTOGLOBULIN**; ELECTRODIALYSIS; FACTORS AFFECTING; FIRMNESS; FORMATION; GELATION; GELLING PROPERTIES; GELS; HEATING; **LACTOGLOBULIN**; PROPERTIES; **PROTEIN** GELS; PROTEINS; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 18 Feb 1994

L8 ANSWER 178 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 334396 FROSTI
TI Polymerisation of **whey** proteins in **whey protein**-solubilised emulsions.
AU Monahan F.J.; McClements D.J.; Kinsella J.E.
SO Journal of Agricultural and Food Chemistry, 1993, 41 (11), 1826-1829 (20 ref.)
DT Journal
LA English
SL English
AB The physicochemical properties of **whey** proteins in relation to their capacity to form and stabilise emulsions are of interest to the food industry. This study examines the effect of emulsion storage time on polymerisation of **whey** proteins in an emulsion stabilised by **whey protein isolate** (WPI). The participation of individual **whey** proteins, beta-**lactoglobulin** (beta-Lg), alpha-**lactalbumin** (alpha-La), bovine serum albumin and immunoglobulins, in the polymerisation reaction at the oil-water interface was also studied. High-molecular-weight **protein** polymers were formed at the oil-water interface and were accompanied by reductions in beta-Lg and alpha-La concentrations. This was attributed to intermolecular polymerisation between alpha-La and beta-Lg. Bovine serum albumin and immunoglobulins were assumed to have little effect on the polymerisation.
SH BIOCHEMISTRY
CT ALBUMINS; ALPHA; ALPHA **LACTALBUMIN**; BETA; BETA **LACTOGLOBULIN**; BOVINE SERUM; BOVINE SERUM ALBUMIN; CATTLE; EMULSIONS; FORMATION; HIGH; HIGH MOLECULAR WEIGHT; HIGH **PROTEIN** ; HIGH QUANTITY; **LACTALBUMIN**; **LACTOGLOBULIN**; MOLECULAR WEIGHT; POLYMERIZATION; POLYMERS; PROTEINS; SERUM; SERUM ALBUMIN; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 1 Feb 1994

L8 ANSWER 179 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 332460 FROSTI
TI Disulfide formation affects stability of **whey protein isolate** emulsions.
AU McClements D.J.; Monahan F.J.; Kinsella J.E.
SO Journal of Food Science, 1993, 58 (5), 1036-1039 (16 ref.)
DT Journal
LA English
SL English
AB **Whey protein** isolates are used as functional ingredients in foods. One of its components, beta-**lactoglobulin** , partially unfolds when it is adsorbed at an oil-water interface. This exposes the free sulfhydryl groups. If the conditions were such that disulfide bonds formed between the **protein** molecules adsorbed at the interface, the surface viscoelasticity of the **protein** film around the droplet would increase, improving the stability of the droplet. This paper investigates the formation of this kind of bond and the physical properties of emulsions stabilised in this way.

SH BIOCHEMISTRY
CT BETA; BETA **LACTOGLOBULIN**; CHEMICAL; CHEMICAL METHODS; CHEMICAL MODIFICATION; CHEMICAL PROPERTIES; EMULSIFIERS; IMPROVEMENT; INCREASE; **LACTOGLOBULIN**; MODIFICATION; PROPERTIES; STABILITY; **WHEY**
DED 6 Jan 1994

L8 ANSWER 180 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 321352 FROSTI
TI The effect of alpha-**lactalbumin** and beta **lactoglobulin** on the texturization of rennet casein.
AU Ido k.; Inoue S.; Takano K.; Nishiya T.; Tatsumi K.; Kamoi I.
SO Nippon Shokuhin Kogyo Gakkaishi, 1993, 40 (4), 272-274 (8 ref.)
DT Journal
LA Japanese
SL Japanese; English
AB This study investigated the effect of addition of alpha-lactoalbumin and beta-**lactoglobulin** on the texturisation of rennet casein. The alpha-**lactalbumin** and beta-**lactoglobulin** were extracted from **whey protein isolate**. Addition of beta-**lactoglobulin** was found to decrease the hydrophobicity of the textured casein rennet, while addition of alpha-**lactalbumin** did not. This decrease in hydrophobicity is suggested to be due to the formation of beta-**lactoglobulin**-casein complexes during cooking. The casein rennet product blended with beta-**lactoglobulin** had a better fibrous structure than that containing alpha-**lactalbumin**. It is suggested that the beta-**lactoglobulin** present in **whey protein isolate** is responsible for improving the fibrousness of the textured casein rennet product blended with **whey protein isolate**.
SH PROTEINS
CT CASEIN; FIBROUS; HYDROPHOBICITY; **LACTALBUMIN**; **LACTOGLOBULIN**; PROTEINS; RENNET; RENNET CASEIN; STRUCTURE
DED 20 Jul 1993

L8 ANSWER 181 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 321185 FROSTI
TI A micro-scale method for measuring the hardness of heat-induced **protein** gels.
AU Lee S.-P.; Batt C.A.
SO Journal of Texture Studies, 1993, 24 (1), 73-79 (11 ref.)
DT Journal
LA English
SL English
AB It has been reported that firmness is a useful parameter to describe the rheological properties of a gel. A micro-scale penetrometry method for testing the firmness of heat-induced **whey protein** gels is described. It was demonstrated that there was a high correlation between the values obtained using an Instron and those obtained using the micro method for beta-**lactoglobulin** gels. In addition, there appeared to be a high degree of correlation for firmness measurements between the two methods for gels made from either **whey protein isolate** or bovine serum albumin. It is concluded that micro-scale penetrometry could be used to measure the firmness of heat-induced **whey protein** gels, thus circumventing the use of the Instron test.
SH PHYSICAL AND SENSORY
CT DAIRY PRODUCTS; EVALUATION; FIRMNESS; GELS; HEATING; INDUCTION; MILK **PROTEIN**; MILK PROTEINS; PHYSICAL; PHYSICAL PROPERTIES; PROPERTIES; **PROTEIN** GELS; PROTEINS; SENSORY; SENSORY ANALYSIS; SENSORY PROPERTIES; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 16 Jul 1993

L8 ANSWER 182 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 320429 FROSTI
TI Heat-induced gelation of the mixtures of alpha-**lactalbumin** and beta-**lactoglobulin** in the presence of glutathione.
AU Legowo A.M.. Imade T.; Hayakawa S.
SO Food Research International, 1993, 26 (2), 103-108 (24 ref.)
DT Journal
LA English
SL English
AB Beta-**lactoglobulin** and alpha-**lactalbumin** represent 50% and 12%, respectively, of **whey** proteins and are largely responsible for **whey protein isolate**'s functional characteristics and gelling properties. This paper determines the influence of glutathione and sodium chloride on the gel strength and heat-induced gelation of mixtures of alpha-**lactalbumin** and beta-**lactoglobulin**. Both compounds were found to have a significant influence on gel formation. In mixed gels, evidence was found showing that alpha-**lactalbumin** and beta-**lactoglobulin** interacted together during gel formation.
SH BIOCHEMISTRY
CT ALPHA; ALPHA **LACTALBUMIN**; BETA; BETA **LACTOGLOBULIN**; DETERMINATION; FORMATION; GELATION; GLUTATHIONE; HEATING; **LACTALBUMIN**; **LACTOGLOBULIN**; MIXTURES; PROTEINS; SODIUM CHLORIDE; STRENGTH; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 1 Jul 1993

L8 ANSWER 183 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 308144 FROSTI
TI Gelling properties of **whey protein isolate**: influence of calcium removal by dialysis or diafiltration at acid or neutral pH.
AU Lupano C.E.; Dumay E.; Cheftel J.-C.
SO International Journal of Food Science and Technology, 1992, 27 (6), 615-628 (25 ref.)
DT Journal
LA English
SL English
AB It is considered that **whey protein** isolates (WPI), rich in beta-**lactoglobulin**, are major sources of functional food ingredients. It was demonstrated that dialysis or diafiltration of WPI removed much more calcium when carried out at acid pH than at neutral pH. The effects on the functional properties of WPI, including water-holding capacity, elasticity, firmness and **protein** solubility of thermally-induced gels, are reported. It is concluded that a wide range of physical characteristics could be obtained by varying the calcium content of WPI gels. It is suggested that WPI gels prepared at acid pH and at low calcium concentrations may be suitable as fat replacers in acid foods.
SH DAIRY PRODUCTS
CT DAIRY PRODUCTS; DIALYSIS; EVALUATION; FACTORS AFFECTING; FILTRATION; FUNCTIONAL; FUNCTIONAL PROPERTIES; GELATION; GELLING PROPERTIES; ISOLATES; MILK **PROTEIN**; MILK PROTEINS; PROPERTIES; **PROTEIN** ISOLATES; PROTEINS; SENSORY; SENSORY ANALYSIS; SENSORY PROPERTIES; ULTRA; ULTRAFILTRATION; WATER; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 6 Apr 1993

L8 ANSWER 184 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 303530 FROSTI
TI Specific divalent cation-induced changes during gelation of beta-**lactoglobulin**.

AU Foegeding E.A.; Kuhn P.R.; Hardin C.C.
SO Journal of Agricultural and Food Chemistry, 1992, 40 (11), 2092-2097 (24 ref.)
DT Journal
LA English
SL English
AB It is known that the specific textural properties of **whey protein isolate** gels can be selectively altered by addition of monovalent or divalent cations. This study investigates whether this effect is due to the predominant **protein** in **whey protein isolate**, beta-**lactoglobulin**, or to interactions amongst all the proteins. The effect of sodium and calcium chloride on the gelation of beta-**lactoglobulin** sols and on the properties of both beta-**lactoglobulin** and **whey protein isolate** gels was investigated. Beta-**lactoglobulin** gels showed an increase in the true shear strain at fracture in the presence of calcium ions, indicating that other **whey** proteins are not required for this effect. Gelation and rheological properties of gels of beta-lactglobulin were cation-dependent but could not be explained by cation-associated differences in structure or denaturation characteristics determined by circular dichroism measurements.
SH PROTEINS
CT CATION; EVALUATION; GELATION; GELLING PROPERTIES; GELS; **LACTOGLOBULIN** BETA; PROPERTIES; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 5 Feb 1993

L8 ANSWER 185 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 296121 FROSTI
TI Microcoagulation of a **whey protein isolate** by extrusion cooking at acid pH.
AU Queguiner C.; Dumay E.; Salou-Cavalier C.; Cheftel J.C.
SO Journal of Food Science, 1992, 57 (3), (ref.)
DT Journal
LA English
SL English
AB Microparticulated proteins are of interest as fat substitutes in the formulation of reduced-fat foods. A **whey protein isolate** rich in beta-**lactoglobulin** was coagulated at acid pH in a twin-screw extruder under shear forces and moderate heating. The biochemical and rheological characteristics were studied as a function of extrusion mix and processing parameters. Microscopy and laser diffractometry confirmed that the semi-solid spread-like material obtained was composed of small coagulated particles.
SH PROTEINS
CT COAGULATION; COOKING; COOKING FATS; EXTRUSION; EXTRUSION COOKING; FAT SUBSTITUTES; FATS; ISOLATES; MICRO; PH; **PROTEIN** ISOLATES; **PROTEIN** SUBSTITUTES; PROTEINS; REPLACEMENT; SUBSTITUTES; **WHEY**; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 21 Oct 1992

L8 ANSWER 186 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 271597 FROSTI
TI Changes in gelling behaviour of **whey protein isolate** and beta-**lactoglobulin** during storage: possible mechanism(s).
AU Rector D.; Matsudomi N.; Kinsella J.E.
SO Journal of Food Science, 1991, 56 (3), 782-8 (30 ref.)
DT Journal
LA English
SL English
AB **Whey** proteins are widely used in the food industry. However, it

has been reported that storage can have a significant effect on their functional characteristics. This paper investigates the causes of these changes using **whey protein isolate** and beta-**lactoglobulin** (the main **whey protein**). Specifically, it investigates the effects of storage temperatures on the gelling behaviour of the two systems. The results indicate that some denaturation and **protein:protein** interactions occur during storage at higher temperatures, which have a negative effect on the gelling properties of the proteins. Accelerated storage tests indicate that polymerisation occurs even at the lowest temperature tested - 40 C. The processing techniques used may also have an effect on the gelling behaviour of the proteins.

SH PHYSICAL AND SENSORY

CT BETA **LACTOGLOBULIN**; DETERMINATION; GELATION; ISOLATES; **LACTOGLOBULIN**; PROPERTIES; PROTEINS; STORAGE; TEMPERATURE; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 12 Nov 1991

L8 ANSWER 187 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 251773 FROSTI

TI Spontaneous gelation of **whey** proteins in urea and guanidine hydrochloride.

AU Katsuta K.; Kinsella J.E.

SO Agricultural and Biological Chemistry, 1990, 54 (9), 2423-4 (9 ref.)

DT Journal

LA English

AB It is reported that both **whey protein isolate** and beta-**lactoglobulin** (the major component of **whey protein**) spontaneously form gels without heating in the presence of urea or guanidine hydrochloride. Some of the rheological characteristics, including viscosity, elastic modulus and shear modulus, of these gels were determined. The viscoelasticity of the gels was found to increase with time of storage.

CT GELATION; GUANIDINE HYDROCHLORIDE; HEAT FREE; PROTEINS; UREA; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 15 Apr 1991

L8 ANSWER 188 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 246143 FROSTI

TI Mechanism of urea-induced **whey protein** gelation.

AU Xiong Y.L.; Kinsella J.E.

SO Journal of Agricultural and Food Chemistry, 1990, 38 (10), 1889-91 (21 ref.)

DT Journal

LA English

SL English

AB **Protein** gelation is an important functional property of feed systems. The mechanism by which urea acts upon the structure of **whey protein isolate** to promote gelation has been investigated. The urea-induced formation of a gel by **whey protein isolate** was accelerated as pH increased in the alkaline range. Addition of N-ethylmaleimide inhibited gelation. The sulphydryl content of the **isolate** decreased during urea incubation, especially with increasing pH. Electrophoretic analyses revealed the progressive disappearance of alpha-lactolbumin, beta-**lactoglobulin** and serum albumin during gelation with concomitant formation of polymers of these proteins.

CT GELATION; MECHANISMS; PROTEINS; UREA; **WHEY PROTEIN**; **WHEY** PROTEINS

DED 22 Jan 1991

L8 ANSWER 189 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN

AN 202178 FROSTI

TI Effect of heat and other factors on the structure and behaviour of selected proteins. Part VI. The molecular characteristics and digestibility of egg albumen and **whey protein isolate**.
AU West S.I.
SO Leatherhead Food Research Association, 34pp. ., 1986, 29 ref.
NTE Research Report No. 538. CONFIDENTIAL: for Members only.
DT (Leatherhead Food Research Association publication)
LA English
SL English; French; German
CT AGGLOMERATES; AGGLOMERATION; CHROMATOGRAPHY; CONFORMATION; DETERMINATION; DIGESTIBILITY; EGG **PROTEIN**; EGG PROTEINS; EGG WHITE; ELECTROPHORESIS; EVALUATION; FORMATION; GEL CHROMATOGRAPHY; GEL ELECTROPHORESIS; HEATING; IDENTIFICATION; **LACTALBUMIN**; **LACTOGLOBULIN**; LFRA PUBLICATIONS; MOLECULAR STRUCTURE; NUTRITIONAL VALUE; PRECIPITATION; PROPERTIES; **PROTEIN** ISOLATES; PROTEINS; SDS; SODIUM CHLORIDE; SPECTROSCOPY; STRUCTURE; TITRATION; UV SPECTROSCOPY; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 31 May 1989

L8 ANSWER 190 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 199861 FROSTI
TI Sulfhydryl group/disulfide bond interchange reactions during heat-induced gelation of **whey protein isolate**.
AU Shimada K.; Cheftel J.C.
SO Journal of Agricultural and Food Chemistry, 1989, 37 (1), 161-8 (32 ref.)
DT Journal
LA English
SL English
AB The effect o pH and **protein** concentration on the kinetics of reaction between 5,5'-dithiobis(2-nitrobenzoic acid) and the sulphydryl groups of beta-**lactoglobulin** were determined, in order to study the interchange between sulphydryl groups and disulphide bonds during the heating of dispersions of **whey protein isolate**. Correlations with gel texture and **protein** solubility were studied.
CT BOND; CONCENTRATION; DISULPHIDE BONDS; DITHIOBISNITROBENZOIC ACID; GELATION; GELS; GROUPS; HEATING; INTERACTIONS; **LACTOGLOBULIN**; MECHANISMS; PH; **PROTEIN** GELS; **PROTEIN** ISOLATES; PROTEINS; RATE; SOLUBILITY; TEXTURE; THIOL GROUPS; **WHEY PROTEIN**; **WHEY** PROTEINS
DED 19 Jun 1989

L8 ANSWER 191 OF 191 FROSTI COPYRIGHT 2004 LFRA on STN
AN 191192 FROSTI
TI Preaning stability of fluid emulsions containing different milk **protein** preparations.
AU Leman J.; Haque Z.; Kinsella J.E.
SO Milchwissenschaft, 1988, 43 (5), 286-9 (26 ref.)
DT Journal
LA English
SL English; German
AB Emulsions were prepared from skimmed milk proteins, beta-**lactoglobulin**, **whey protein isolate** and micellar casein at an oil/water ratio of 4:6 using a single piston valve homogeniser. The effects of pH, ionic strength, **protein** concentration, energy input and heat treatment on the relative stability of the emulsions was investigated. Emulsion stability depended upon the amount and type of **protein** adsorbed onto the dispersed phase globule surface. This was affected by the concentration of **protein** in dispersion, pH and emulsifying time.
CT CONCENTRATION; CREAMING; EMULSIFICATION; EMULSIFYING CAPACITY; EMULSIFYING PROPERTIES; EMULSIONS; EVALUATION; FACTORS AFFECTING; HEAT

STABILITY; HEATING; HOMOGENIZATION; IONS; MILK **PROTEIN**; MILK PROTEINS; OIL EMULSIONS; PH; POWER; PROPERTIES; PROTEINS; STABILITY; TYPE; WATER EMULSIONS

DED 25 Oct 1988